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BUG BOOK

and
AGRICULTURAL
SPRAY GUIDE
No. 18

STERLING CHEMICAL CO.
CAMBRIDGE MASS.

DON'T THROW THIS AWAY

KEEP IT—file it with your reference books and papers and refer to it when your stock or crops are “sick” or “buggy.” The Spraying Calendar, the description of insects, the story of what is best for protecting crops and animals is good “stuff.” Save it.

No purchase should be more carefully considered than the purchase of Insect Killers and Fungous Remedies. Don't let a low price tempt you. It is not the price you pay but what the article will do that counts.

Price is what you pay for an article. Cost is determined after its use.

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If you wish orders mailed add postage to your remittance or we shall understand that you want them sent by express or freight.

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STERLING CHEMICAL COMPANY,
Cambridge, Mass.

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FRIENDS OF YOURS

EVERY DAY we hear someone say "Why do we have so many more insect pests now than we used to have? I can't raise a thing—fruit, flower or vegetable—without a pitched battle with insects."

We have been killing insect-eating birds by the thousand for fun and for food and by the million for their feathers.

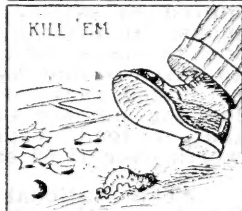
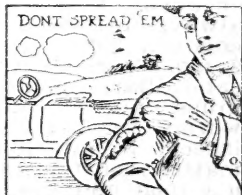


Our forests are being cut down and the few trees that remain in our cities and towns are being hacked and trimmed by the telephone and trolley companies until but a few stumps remain, and but few artificial nesting or retreating places are replacing the natural ones destroyed.

While our helpful birds are being driven away and killed we offer protected nesting places in the cornices and eaves of public buildings and an abundant food supply from street droppings to the foreign, not-fit-to-be-naturalized, piratical English sparrow, who destroys the young of the insect-eating birds and lives on seed and grain himself. Thus Man has upset one of the most important balances

established by nature to control the insect growth and is paying for his folly by the increased number of insect pests. In our efforts to restore this balance every natural insect enemy should be encouraged and instead of getting after the thousands of worms we should go after the butterfly before she lays her eggs. Part of the millions spent for poison and spraying should be used to exterminate the egg-laying butterfly and moths. Here again the bird helps, as moths are one of their special "tid-bits."

Do not spread insects, or allow an opportunity to pass for destroying them. Every one can help a little. The mother who tells her little son to "let the little birdie go and not harm it," when he traps a butterfly under his hat, helps to keep up the high



cost of destroying

FRIENDS OF YOURS—Continued

insects. That caterpillar you brushed from your coat at Cleanville and neglected to crush, may have boarded you fifty miles back in Bugtown, and it may cost the taxpayers of Cleanville a million dollars to control or exterminate his progeny.



Protect the birds. They are busy long before you are awake and their keen eyes can detect insects rods away that are invisible to the human eye even when close at hand. Invite them with protected nests, bathing places, and a little food hung at convenient places, and as soon as they make their home near you your insect troubles will decrease and you will have interesting neighbors who will furnish you with the sweetest music.*

Use as little poison as possible for killing insects, resort to mechanical means when practical. Starve the English sparrows, kill them and at every opportunity destroy their nests. Turn the

cat loose on them and equip "the boy" with an air gun. Give no quarter to these pirates, the great bird enemy of our helpful birds.

There are many other natural insect enemies. There is no more energetic, always-on-the-job insect eater than the common homely, ordinary toad. He is a most persistent exterminator of ants, caterpillars, plant lice, spiders, snails, grasshoppers, angle worms, tomato worms, flea beetles, in fact almost every insect is acceptable to him. Animal matter constitutes ninety per cent. of his food and the number of insects required to satisfy his appetite is enormous. In France many firms do a thriving business loaning and selling toads to farmers and gardeners. It has been estimated, that based on the cost of killing the number of insects with poison that a toad would destroy, they are worth over \$5.00 each.



*The National Association of Audubon Societies, 1974 Broadway, New York City, furnish pamphlets on "how to attract birds."

FRIENDS OF YOURS—Continued

Always help a toad along, encourage him, by leaving him alone, to remain on your premises. Make shallow holes in the ground and cover them with flat stones or boards. They will use them daytimes for shelter. Farmers and gardeners wherever possible should propagate toads. They breed in swampy places the same as frogs and little toad, tadpole, requires little or no attention. Toads generally remain near the locality where they are raised providing the food supply is plentiful.



Lady Bug Beetle

All insects are not injurious. One of the best known beneficial insects is the lady bird, sometimes called lady-clock, lady cow, lady fly, lady bug, but known best as "lady beetle." There are some ten species of this well known friendly insect, which is very destructive both as beetles and larvae, to many forms of insect life, especially to aphids. They are hemispherical in form, with a smooth, polished surface, and are often colored red, brown, or black with small spots of brighter colors. About the worst sin committed by toads is that

they occasionally (by mistake no doubt?) kill one of these helpful insects, but this transgression is not frequent. These Lady Beetles as well as their young or larvae are often mistaken for injurious forms and are unfortunately killed. The Lady Beetle young vary in length all the way up to about a half inch, are bluish or blackish in color, often with orange spots on the back, and resemble very much a miniature alligator in general appearance. They crawl about freely and do wonderful service in destroying large numbers of plant lice, scale insects, etc.

Always encourage and make existence easy for the natural insect enemies, birds, toads, helpful insects and parasites.
Everybody—Pull together to kill insect pests without poison.

YOUR INSECT ENEMIES

THE GREAT difference between insects, their habits, food and methods of attack, makes it imperative that you study insect troubles before you try to remedy them. There is no such thing as success for the "hit or miss" fellow in fighting insect pests. You must apply the right material at the right time, thoroughly, and anyone not willing to inform himself sufficiently to do this is just as sure of success as a boy who set a mouse trap for a crocodile.

Don't scrimp on quality or quantity when buying insect killers and fungous remedies. The best is none too good. Scrimping to save not over twenty cents on an acre of potatoes once made a difference between a full crop and a total failure. Buy reliable goods made by reliable makers and apply them liberally according to directions. It takes just as much time to apply a poor article as it does a good one. Use a poor one and you stand a chance of losing the crop you wish to save, the time it takes to apply and the cost of the goods.

Spraying for fungi and insects is not an expense. It is an insurance that pays "big." Take it into consideration when planting as part of the necessary investment. It is just as important as cultivating or fertilizing. If you cannot afford time or money to protect your crops after they are planted, don't plant them.

With the down-to-date mixtures the caring for crops has been greatly simplified, for instance, **Sterlingworth Ar-Bo** (see page 48) kills most fungi and leaf eating insects with one spraying. It is the great apple and potato spray. Years ago three, perhaps four, sprayings would be required to do what **Sterlingworth Ar-Bo** does with one.

FUNDAMENTALS OF INSECT CONTROL

UPON THE way in which an insect obtains its food depends usually the control measure to be used against it. From a practical standpoint, insects feed in one of two ways, either by (1) biting off and swallowing particles of solid food, as in the case of caterpillars, beetles, etc., or (2) by sucking the juices of plant or animal, as in the case of plant-lice, scale insects, etc.

Accordingly there are three chief ways of attacking insect pests.

(1). By placing a poison on the food so that it is swallowed with the food. Such poisons act in the stomach and are called stomach poisons. **Sterlingworth** arsenate of lead is a common stomach poison. These are used against leaf-eating and other insects which bite off and swallow food, such as caterpillars, leaf, beetles, etc.

(2). By hitting insects with materials which kill by contact with their bodies. Such materials are called contact

insecticides. Soap solutions, nicotine sprays, kerosene emulsion are examples of contact insecticides. These are used against insects which pierce beneath the surface of a plant or animal and suck the juices, such as plant-lice, scale insects, etc. A stomach poison would be useless against sucking insects since they pierce beneath the surface upon which the poison is spread before feeding is begun. Success with a contact spray depends almost entirely upon thoroughness. **EACH INSECT MUST BE HIT BY THE SPRAY TO BE KILLED.** A contact insecticide should be strong enough to destroy the insect against which it is being used and yet weak enough so that it will not injure the plants which are subjected to it.

(3). By using poisonous gases. These kill all kinds of insects but they can be used only under certain circumstances. The chief gases which are used against insects are carbon bisulphide, hydrocyanic acid gas and sulphur fumes.

CONTROL OF LEAF AND FRUIT-EATING INSECTS, BORERS, ETC.

THESE insects are usually controlled by spraying a poison over the food which the insect is eating or by mixing a poison with the food. Materials, which give off poisonous vapors, are often used against borers in trees, etc. Practices known by the general term "Farm Practice," such as trapping insects, late fall ploughing, destruction of insects by cutting them out of infested plants, etc., are often employed without the aid of insecticides.

APPLE MAGGOT OR RAILROAD WORM. The apple maggot is the young of a small barred-winged fly less than a quarter of an inch long. The flies puncture the skin of apples, especially summer and autumn varieties, such as the Red Astrachan, Bough and Wealthy, and lay their eggs in the pulp beneath. The eggs are usually laid during July. The maggots "railroad" through the pulp ruining fruit which, to outside appearances, is perfectly sound. The work of the apple maggot can be distinguished from that of the codling moth, since the larvae of the latter feed almost entirely about the core.

CONTROL. Spray foliage of susceptible varieties two or three times at intervals of ten days, beginning July 1, with the following:

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued

Cheap molasses or syrup, 13 pounds
Sterlingworth Arsenate of lead, 2 1-2 pounds
Water, 50 gals.

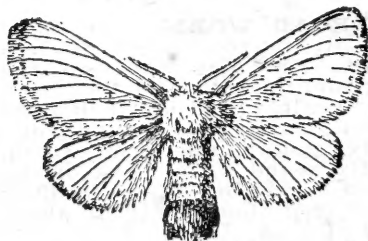
A coarse spray is preferable. A pint of this mixture should be enough for a medium sized tree. This destroys the adult flies before they lay their eggs. It is not attractive to bees.

ASPARAGUS BEETLES. There are two common asparagus beetles. One is bluish-black and has yellow marks on the back. The other species is of a light brown color with twelve black spots on the back. The eggs are black and are laid on the asparagus stems. These eggs hatch in from six to ten days and the greenish grubs feed until maturity, when they drop to the ground, change to pupae and the adults emerge soon after. There are several broods each year.

REMEDY. Let chickens run through the rows. The beetles prefer to lay their eggs on the tallest stalks. Keep some of these stalks for traps and either spray them heavily with **Sterlingworth Arsenate of Lead** or cut and burn them from time to time. Dust the plants in the morning while the dew is still on, with air-slaked lime. This will kill many of the young grubs. As soon as the cutting season is over, spray the plants heavily with **Sterlingworth Arsenate of Lead** and repeat a month later if the beetles are still numerous.



Asparagus
Beetle



Female
Browntail Moth

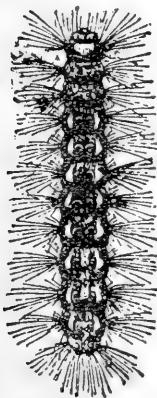
BROWN-TAIL MOTH.

The eggs are laid on the under side of the leaves in clusters of one to three hundred, during July in New England. They hatch in about three weeks and the young caterpillar worms forage at once. In the late fall the partly grown caterpillars gather in nests attached to the branches, and hibernate until spring. They emerge about the time the leaves spring and commence to feed. By the

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued



Winter web of
Brown-tail Moth
caterpillars



Brown-tail Moth
caterpillar

middle of June they have their growth and are from one to one and one-half inches long, brownish in color, quite hairy, with a line of white spots on each side of back. Near the rear end of the back there are two large, brilliant orange spots. The hairs on the sides of the body are barbed. These the caterpillar sheds at maturity, and persons upon whom they fall suffer from a serious unpleasant itch. When matured they spin a cocoon around themselves and emerge as a moth in about two weeks. The female is about one and one-half inches from tip to tip of wings and is clear white except that she has a large tuft of brown hairs on the extreme rear end of her body. These moths are great night fliers and cover great distances. This makes it impossible to limit their zone of operation. They are greatly attracted by bright lights, which would seem to suggest a method of extermination worth considering. Some non-poisonous, mechanical method of killing the moths must be discovered or it will cost more than the Civil War to hold this insect in check.

Remedy: Clip off the nests during the winter and burn. If you neglect to do this, spray with **Sterlingworth Arsenate of Lead** (See page 49). They attack all fruit trees and a large number of ornamental shrubs and shade trees.

BUD MOTH OR BUD WORM. The worms or larva winter in a half-grown state in a silk cocoon patched with bits of leaves and bark attached to the tree twigs. They emerge at apple budding time as worms about three-sixteenths of an inch long. They feed at night on the buds and tender foliage. In six to eight weeks they get their growth, form a cocoon by cementing leaves and tying them together with silken threads. A change to moth occurs in ten to twenty days. The moth lays eggs on the under side of leaves which hatch in about ten days. This new crop of larvae or worms spin a web of silk for their protection while they feed upon the tender

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued

leaves until frost time, then they hibernate until spring. These insects cut down fruit crops by destroying the buds.

Remedy: If you spray for codling moth the same spray will usually protect against this pest. In old orchards or where bud worm injury has been severe in the past, spray with **Sterlingworth Ar-Bo** (page 48) as soon as the buds unfold in the spring, and force the spray well into the new growth.

CABBAGE WORM. The mother butterfly is clear white—one and three-fourths inches across from tip to tip of wings. Tips of wings are dark. Each front wing has two black spots—each back wing has one black spot. In New England the moth lays the eggs on leaves about the last of June. They hatch slimy, naked, green worms in six to ten days. These worms attack the leaves especially the tender leaves in the center of the head. They mature in two or three weeks, reaching a length of about one inch. They crawl to some secluded place and change to the chrysalis stage, from which the parent butterflies appear about two weeks later. There are several broods each year, the winter being spent in the chrysalis stage.



Cabbage Worm

Control: During the first two months of growth, cabbage plants (it is claimed by many) can be sprayed with **Sterlingworth Arsenate of lead** without danger of poisoning from eating the plants later. Chemical tests seem to have proved this. A whale oil soap solution added to the Arsenate of lead aids in sticking it to the plants. After the plants are well headed, if further treatment is necessary, use **Sterlingworth Hellebore** (page 54) or **Sterlingworth He-Bo**, see page 54.

CABBAGE LOOPER. The history of this insect is similar to that of the Cabbage Worm. The larvae which does the eating is a green worm about one and one-fourth inches long, has no legs in center of body and crawls with a looping motion. Cabbage Loopers attack the same vegetation as the Cabbage Worm. Remedy the same.

CANKER WORM—Sometimes called "**MEASURING WORMS**" because they "hump up" in the middle, are about seven-eighths of an inch long and are as big around as a six-penny nail.

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued



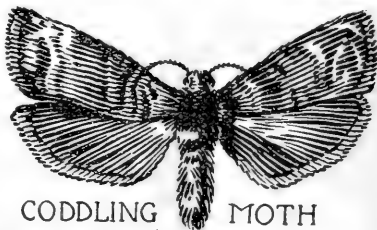
Canker Worm Moth and
Canker Worm

The wingless female mother moth crawls up the tree in the spring and lays her eggs in the irregularities of the bark on the trunks and limbs. The larvae hatch and commence to eat when the first leaves appear. They mature in about four weeks, descend, burrow into the ground, change to a pupa and stay dormant until spring.

Control: Where serious injury by these insects has occurred, band the trees with tree tanglefoot in October and freshen these bands again the following April. Never put tanglefoot directly upon bark of young fruit trees. Injury may result. Tie a strip of paper about the trunk and smear the tanglefoot over this. Shallow cultivation in

the orchard in the fall will destroy many of the pupae in the ground. If trees become infested to an extent to warrant treatment, spray with **Sterlingworth Arsenate of lead** or **Sterlingworth Ar-Bo**, pages 48-49). The latter is preferable on fruit trees. These worms attack all fruit trees, especially apple.

CODLING MOTH OR APPLE WORM. This insect is a fruit feeder, attacking apples and pears in particular, and causes more actual loss to growers of fruit than any other fruit insect. The "wormy" apple is well known and needs no description. The winter is spent by the full-grown larvae in small white cocoons beneath loose bark, and in other protected places. About apple blossom time these larvae change to pupae and the parent moths appear about two weeks later. These moths are grayish-brown in color, have a band of bronze beyond the middle of the fore wings, and a wing expanse of about three-quarters of an inch. The female moths commence to lay their eggs in a few days, each female laying from 60 to 75.



CODDLING MOTH

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued



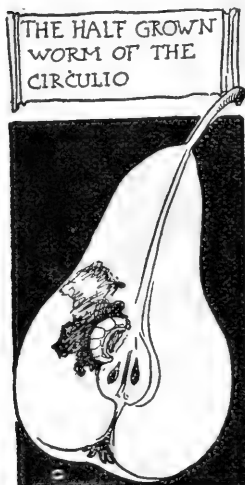
OPEN
CALYX

THE RIGHT TIME TO SPRAY



CLOSED
CALYX

THE WRONG TIME TO SPRAY



Most of the eggs are placed on the leaves. These hatch in the course of several days and the young worms usually feed a little on the tender leaves before they make their way to the young fruit and bore into it through the blossom end. Practically all of the feeding is done about the core. About mid-summer these larvae become full grown, bore out to the surface and seek a place to form their cocoons. There is sometimes a partial second brood in Massachusetts, the moths of which appear late in July or early August.

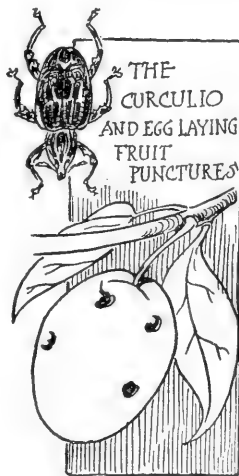
Control: Spray apple and pear foliage and fruit **just after** the blossoms fall with **Sterlingworth Arsenate of lead**, page 49 or **Sterlingworth Ar-Bo**, (page 48). Don't delay this application. It will be worthless if delayed. Force the spray into the blossom ends. At this time the calyx sepals are open and will hold some of the poison ready for the worms when they begin to bore into the fruit. The calyx sepals close a couple of weeks after the blossoms fall and it will then be too late to place the poison where it will be effective. Make a second application ten days after the first for best results, and spray about the first of August for the second brood. **Sterlingworth Ar-Bo** (page 48) will not only control the codling moth but certain fungous diseases as well. It is a double spray, combining two operations in one.

CURCULIO. This insect attacks apple, pear, plum, peach, cherry and all pome and stone fruits. The adult beetle is one-fourth of an inch long, dark brown in color with gray mottles; has six legs, a very chunky body about half as wide as the beetle is long. The head and snout are shaped like the letter V. With this V-shaped bill a hole is punctured in the fruit and the pulp extracted as far as the bill will reach and

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued

an egg deposited in the hole which is then plugged with a sticky excrement. The eggs hatch in three to six days and the resulting grub commences to burrow into the fruit. This is its sole vocation for two or three weeks, when the worm or larva reaches maturity. He then bores his way out of the fruit, crawls down the tree and buries himself about two inches deep in the ground, where he forms an earth cell, and in four to six weeks emerges as a beetle. The grubs rarely mature in apples but the injury caused by the egg-laying of the parent female heals over, causing a russet scar, and frequently gives the fruit a gnarled appearance. Such injury results in a large percentage of second grade fruit. The beetle winters in some convenient, sheltered crack or crevice—sometimes in the ground and sometimes in bushes or partly decayed fruit. Fruit entertaining this pest generally falls from the tree before maturity. If it ripens it's a "cull," the kind of fruit that is packed in the center of the barrel.

Remedy: During most seasons the codling moth spray just after the blossoms fall, with **Sterlingworth Arsenate of Lead** or **Ar-Bo** will satisfactorily control curculio also, but where severe injury has been caused previous seasons by curculio, and especially if the season is rainy, two sprayings are advisable, the first being applied just after the blossoms have fallen, and the second ten days later. Jarring the trees over sheets in the early morning at the time when the fruit is setting, and destroying the beetles thus collected will materially reduce injury. Shallow cultivation of the orchard during the summer will destroy many of the insects pupating in the ground and is also an excellent practice for preserving the moisture.



CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued

CUTWORMS are the young or caterpillars of several species of moths. They feed entirely at night upon garden and other plants, cutting them off near the ground. During the daytime they lie coiled up just under the surface of the ground. The eggs are laid in July and August, grassland being preferred. Land which has recently been in soil and planted to crops is likely to be badly infested. The eggs hatch in a short time and the young worms feed to some extent in the early fall before seeking winter quarters in the ground. Most of the injury is caused by these caterpillars in the spring. They become full grown the latter part of June or early July, when they crawl into the ground and change to pupae, the moths emerging later. There is a single brood each year.

Remedy: Plow or spade up land to be planted another season as late in the fall as possible. This will destroy many of the worms wintering in the ground. If plants show injury, spread poisoned bait such as **Sterlingworth Cut Worm Killer** (page 25) THINLY over infested fields or gardens. Make the application at dusk in the evening.

ARMY WORMS AND GRASSHOPPERS—A poisoned mash is the best known control for these insects. It is made as follows:

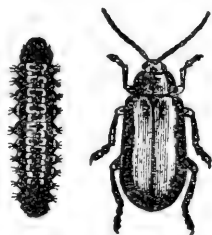
Bran or middlings,	10 pounds
Paris green,	1-2 pound
Cheap molasses or syrup,	3 cupfuls
Oranges or lemons,	2 fruits
Water—to make a stiff mash.	

Mix the bran and Paris green dry, add the molasses or syrup and the juice of the fruits, together with the ground-up fruit rinds. Add enough water to make a stiff mash. Keep poultry away from gardens or fields treated with this mash. The mash should be applied to infested fields about four o'clock in the afternoon. Always spread this material while it is still fresh and moist.

ELM LEAF BEETLE. This beetle is a yellowish brown color, a little over one-fourth inch in length; lays eggs which

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued

hatch in five to eight days. The resulting worms are black when first hatched. They are heavy eaters and change to a yellow color as they grow. They mature in two or three weeks and are then about one-half to five-eighths of an inch long. At maturity they pass down the tree and pupate in the ground and emerge in about six days as beetles. They enter sheds, houses or any other sheltered winter quarters at frost time and are found many times in dwelling houses in the spring. Kill them. Don't let them out. They want to lay their eggs in the trees.



Elm Leaf Beetle
and Larva

Remedy and Preventive: Spray with **Sterlingworth Arsenate of Lead** (page 49) as soon as the beetles appear, which is about June 17th in latitude of Boston.

EUROPEAN CORN BORER. This insect is a European species which has become established in Essex and Middlesex counties in Massachusetts during the past few years. **Present indications are that this will be the worst corn pest we have.** Usually the first indication of injury is the drooping of the tassels which are mined out and destroyed by the caterpillars, often before their function of fertilization has been performed. This means a reduction in the "set" and a loss in yield. In addition the caterpillars make feeding tunnels all through the stalks and even injure the ears themselves. The parent moths are of a deep yellow color and have a wing expanse of about an inch and a half. The wings have numerous zigzag cross lines of a brownish color across them. There are two broods of these insects each year, the moths of the first brood appearing in May and those of the second brood in August. The larvae of this second brood are the more injurious and cause severe injury to late corn. The larvae of the second brood spend the winter in the stalks, change to pupae in the spring and the moths appear soon after.

Control: Since practically all feeding is done within the stalks, treatment with insecticides is useless. In the fall all corn stalks should be disposed of either by burning, feeding to livestock, or should be so deeply composted that it will be impossible for the larvae to survive. Carelessness in overlooking a few stalks, or on the part of a few persons in not carrying out these recommendations, may lead to a serious infestation again another season.

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued

FLAT HEAD APPLE BORER. Similar to the Round Head Apple Borer described below except that it attacks the tree trunk higher up and many times bores into the small branches. **Remedy:** The same as for the Round Head Apple Borer.

To Prevent: Reduce a quantity of **Sterlingworth Whale Oil Soap with Tobacco** (page 47) to the consistency of heavy cream by adding washing soda and water. To each gallon of this mixture add two ounces of crude carbolic acid. Paint the trunks with this mixture.

Remedy: Dig them out with a knife when near the surface or kill by running a flexible wire into tunnel. If you cannot reach borer with a wire squirt a little **Sterlingworth Borer Oil** (page 50) into the tunnel and plug the hole with putty. The vapor does the rest.



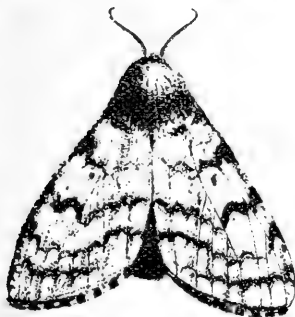
FLEA BEETLE. This is a small, dark-colored beetle that jumps like a flea. The hind quarters are more developed than other non-leaping beetles. There are many species and some one of these species may attack any vegetable or plant. Potatoes seem especially attractive. His depredations are characterized by the shot-like perforations made in the leaves.

Remedy: **Sterlingworth Bordeaux Mixture** (page 45) acts as a repellent and has been found most successful in preventing injury by this pest. Potatoes should be sprayed with **Sterlingworth Ar-Bo**, (page 48) taking pains to cover the underside of the leaves as well as above. **Sterlingworth Ar-Bo** will control the Potato Beetle, Flea Beetle and Potato Blight disease. It is a combination spray. Spray thoroughly.

GYPSY MOTH. The eggs are laid in the fall by the female moth in clusters of two hundred to six hundred, held together by a sticky hairy covering.

WORK OF
FLEA BEETLE ON
POTATO LEAF



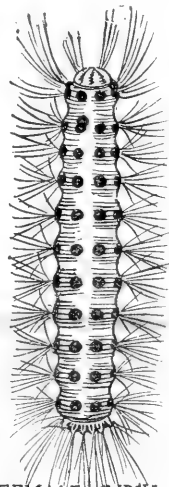


Female Gypsy Moth

dark grayish in color, and has two rows of beautiful colored spots on his back. The first ten nearest the head are bright blue and the balance are blood-colored. It now seeks some sheltered spot, changes to the pupae stage and emerges as the moth a couple of weeks later. The male moths are great day-light fliers. The female is larger than the male and measures two inches or more from tip to tip of wings. She is white in color with dark mottled marks across the wings and does not fly.

Control: The Gypsy Moth attacks nearly every known tree and plant. The most effective way of fighting is to destroy the egg clusters any time between September and April by painting with **Sterlingworth Gypsy Moth Creosote**, (page 51). Banding trees with burlap which offers concealment for the moths and pupae, helps if you look under the burlap daily and destroy all insects gathered there. It is of no use to burlap trees unless you do this. If your trees become badly infested through imperfect protective measures, spraying with Arsenate of Lead is the only recourse (page 49).

Crevices in bark, grass, stone walls, empty cans and bottles, birds' nests, wood piles, or any other place is deemed suitable by the female moth for depositing her eggs for the winter. The egg-mass is yellowish. No climatic change appears to have any effect on their fertility. The young caterpillar when hatched in the spring is about three sixty-fourths of an inch long. They feed at night and hide during the daytime. During his life he passes through at least five changes. At each change he increases in size. When nine to twelve weeks old he is two inches long. At this stage he is hairy,



FEMALE GYPSY
MOTH CATERPILLAR

CONTROL OF LEAF AND FRUIT EATING INSECTS, BORERS, ETC.—Continued

LEOPARD MOTH. The young or caterpillar of the leopard moth is a borer in shade trees, ornamentals and other plants. Trees in the vicinity of Boston have suffered severely from this borer and many trees have been killed by it. The parent moth is white, spotted with black and has a wing expanse of over two inches. The moths begin to appear the latter part of May and are seen until September. The eggs are laid in crevices of the bark and the young caterpillars from these bore through the bark to the woody tissue beneath. It requires two years for the borers to get their growth. They are then about two inches or more in length, white in color and marked with numerous tiny black spots. When mature they change to pupae just beneath the outer bark, and the moths emerge a few weeks later. It is supposed that the reason why these borers are so injurious about Boston and certain other large cities is the absence of woodpeckers and other insectivorous birds in such places. The leopard moth has never become a pest in less thickly populated places where insectivorous birds are more common.

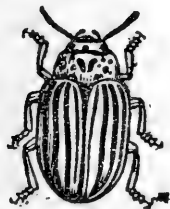
Remedy: Poison sprays are useless against this insect since it feeds almost entirely within the wood where it cannot be reached by such materials. Infested trees may be detected during the summer months, when the borers force large quantities of woody material through the openings to their tunnels. Badly infested trees should preferably be cut down and the wood burned before the borers can mature. Valuable trees or ornamental plants should be gone over carefully and a flexible wire or knife used to destroy the borers. When these cannot be easily reached, a small quantity of **Sterlingworth Borer Oil** (page 50) or Carbon bisulphide should be injected into the tunnels and the openings closed with putty or grafting wax. Both of the above remedies produce a gas which penetrates the tunnels and kills the borers. Carbon bisulphide is inflammable. Keep all fire away.

PEACH TREE BORER: This borer is the young of a delicate, clear-winged moth, having a blue-black body, an orange band across the abdomen and a wing expanse of about an inch. The parent moths appear from June to September and lay their eggs on the trunk of peach trees near the ground. These young bore their way through the bark but usually remain close to the surface until the following spring, when they bore in deeper, become full grown in early summer, change to pupae and the moths emerge soon after. There is a single brood each year. The injury by these borers causes gum to exude from the tree close to the ground and gives the tree a filthy appearance.

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued

Remedy: Mound up the earth for a foot or so about the peach trees. This will force the moths to lay their eggs higher up where the young borer can be more readily found and destroyed. Do this not later than the first of July. The trees should be gone over in October, the earth removed and the young borers destroyed with a knife, or paint the trunk above the mounded earth with **Sterlingworth Borer Oil**, (page 50).

POTATO BUG OR COLORADO BEETLE. This insect confines his attention exclusively to the potato. He is so familiar we will not describe him. The hard-shelled, striped beetles lay eggs in yellow clusters on the under side of the leaf. They hatch in six to eight days into a soft, reddish slug which does the damage. At maturity the slugs descend to the ground, pupate and form the striped beetle which again lays eggs. Two to four broods hatch each season.



Potato Bug and Slug

Preventive: If you have but a few hills, watch for the striped beetles. Pick them and destroy the eggs. **For a Remedy**, spray with **Sterlingworth Ar-Bo** (page 48). This is a combined poison and fungous remedy. By using it you kill with one spraying the bugs and prevent many fungous diseases. Potato vines sprayed with this mixture stay green a long time, resulting in a larger tuber. It does not cost anything to

spray with this mixture, for the increase in yield pays for time and material.

ROSE BUG OR ROSE CHAFER. About the first of July the female beetle burrows into the ground and lays ten to twenty eggs. Worms or larvae hatch in about eight days. They are small and feed on any nearby vegetation until fall. They hibernate in the ground during the winter and dig out in spring, enter the pupa state, and emerge as beetles in two or three weeks. The beetles which do the eating are brown colored, have long spindling legs and are great fliers. They generally appear suddenly in large num-



Rose Chafer

CONTROL OF LEAF AND FRUIT-EATING, INSECTS, BORERS, ETC.—Continued

bers and attack roses, ornamental bushes, fruits and vegetables, but do their greatest damage to grapes.

To Protect Grape Clusters: Tie a paper bag about them soon after forming.

Remedy: When possible hand picking and destroying the beetles will be found most satisfactory, since they are very resistant to poison. Infested plants may be sprayed with a strong solution of **Sterlingworth Ar-Bo** (page 48) which has been sweetened with molasses. **Sterlingworth He-Bo** (page 54), or good, fresh **Sterlingworth Hellebore** (page 54) has been found effective for roses.

ROUND HEADED APPLE TREE BORER. This insect is hatched from eggs laid by the beetle in the bark crevices near the ground. The resulting larvae gradually bores into the tree. His presence may be identified by the sawdust-like chips which fall from his workshop. At maturity it is nearly one inch in length. This insect attacks apple, quince and occasionally pear.

To Prevent: Reduce a quantity of **Sterlingworth Whale Oil Soap with Tobacco** (See page 47) to the consistency of heavy cream by adding washing soda and water. To each gallon of this mixture add two ounces of crude carbolic acid. Paint the trunks with this mixture.

Remedy: Dig them out with a knife when near the surface or kill by running a flexible wire into tunnel. If you cannot reach borer with a wire squirt a little **Sterlingworth Borer Oil** (See page 50) into the tunnel and plug the hole with putty. The vapor does the rest.

SHOT HOLE BORERS. There are several species of tiny bark beetles which attack trees in an unhealthy or dying condition. **To Prevent:** Cut down and burn the infested trees. Bring the others into a healthy state by fertilizing and cultivation. Paint tree trunks and well up into the branches with whitewash to which a little Portland cement and eight ounces of white arsenic to each gallon of mixture have been added.

SQUASH VINE BORER. This insect is one of the most destructive of the many enemies of squashes. The damage is due to the larvae boring through the stems, causing them to rot or so injure the vine as to cause the plant to wilt and die. These larvae are the young stage of a brownish, clear-winged moth, having a wing expanse of about an inch. The moths appear about the second week in July and lay their eggs along the stems. The borers which hatch from these eggs feed within the stems and become full grown in about a month. They then desert the stems and burrow into the earth an inch or two, where they form their cocoons, change to pupae and thus pass the winter. There is a single brood each year.

CONTROL OF LEAF AND FRUIT EATING INSECTS, BORERS, ETC.—Continued

Remedy: The presence of the borers feeding within the stems often becomes evident by the presence of coarse yellowish excrement which is forced from the burrows and accumulates on the ground beneath. The sudden wilting or dying of the leaves during mid or late summer is also usually an indication of borer injury. When possible, cut out and destroy the borers and cover the injured portion of the stem with earth to encourage secondary roots. These secondary roots will carry the plants through and enable them to mature their crop. Destroy old plants and dead vines as soon as the crop is gathered. Early varieties of squashes will act as a protection to late squashes. Plow fields to be planted as late in the fall as possible and harrow these again in the spring. This will destroy many of the insects wintering in the ground. Keep the plants vigorous by cultivation and the use of fertilizers. If possible do not plant near land infested the previous season.

TENT CATERPILLAR. In the spring about the time the foliage begins to expand from the buds, small whitish webs are often found in the crotches of wild cherry and apple trees. These tents are made by the apple-tree tent caterpillar, which, when full grown is about two inches long, black with a light stripe down the back and with dots of blue and white along the sides, and clothed with yellowish hairs. As the caterpillars increase in size the tent is made larger. The tent is the home of the caterpillars on cool or stormy days or nights. The winter is passed in the egg stage, the eggs being laid in a small mass about half an inch long and glued to the twigs with a sticky substance which hardens later. The parent moths are light brown in color, have two white bands across the fore wings and a wing expanse of about an inch. These moths appear usually during the latter part of June. There is a single brood each year.



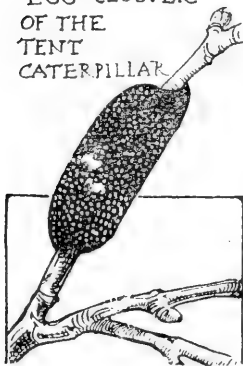
Nest of Tent
Caterpillar

Control: When possible, destroy the winter egg-mass by removing and burning. Destroy wild cherry trees which are useless and serve as a breeding

place for these insects. While the tents are still small in the spring destroy these together with the young caterpillars

CONTROL OF LEAF AND FRUIT EATING INSECTS, BORERS, ETC.—Continued

EGG CLUSTER
OF THE
TENT
CATERPILLAR



in them, by a swab of cloth tied to a pole or crush and wipe them off the trees with a stiff broom. Do this on a cool, dark day or at dusk on a cool evening when the caterpillars are all at home. Do not burn the tents off. This will injure the trees. The treatment for codling moth with **Sterlingworth Ar-Bo** (page 48) will destroy the caterpillars without further attention if the infestation is a mild one.

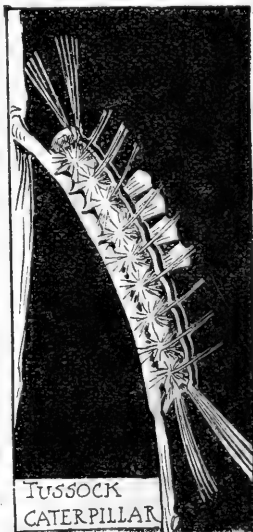
TOMATO WORM OR TOBACCO WORM. The eggs from which this caterpillar is hatched are laid by the moth the last of June. They hatch in six days, the resulting worm, which reaches maturity in about three weeks, grows to be three inches long, and in

diameter to the size of the little finger. Projecting from the end of the body is a horn a quarter of an inch or more in length. These worms burrow into the soil at maturity, pupate and emerge in the spring as moths. Tomatoes and tobacco are the plants generally attacked.

Remedy: The worms are so large and generally so few that hand picking is easy. Spraying with **Sterlingworth Arsenate of Lead** (page 49), five pounds to fifty gallons of water, will be effective.

TUSOCK MOTH. Eggs are laid in early fall by the gray-colored wingless female moth. They are shiny white in color and are deposited in clusters of two to three hundred on the bark of the tree. They hatch in the spring and the young caterpillars commence eating leaves at once. They mature in a month's time, spin a cocoon about themselves and emerge in a short time as moths.

The matured caterpillar is brilliantly colored; head is bright red, body gray and covered with long red, yellow and black hairs and feelers. The under side of the body and legs are yellow. Remedy and preventive are the same as for Gypsy Moth (page 14).



CONTROL OF SUCKING INSECTS

(PLANT LICE OR APHIDS, SCALE INSECTS, ETC.)

SUCKING insects have a beak with which they pierce beneath the surface of the host and extract the juices from within. Where sucking insects are feeding, the tissues are not actually eaten but the extraction of the juices causes a withering, curling or dying of the affected portion, and an examination will usually disclose the presence of insects of this type. A CONTACT INSECTICIDE is necessary to control such insects and since each insect must be hit by the spray in order to be killed, thoroughness of application is very essential. First determine what sort of an insect you are dealing with, that is, whether it is a chewing insect or a sucking insect, and then apply the proper remedy at the right time.

APHIS OR PLANT LICE. There are hundreds of species of this insect. They attack both root and leaf of nearly all plants, shrubs, trees and vegetables, and get their sustenance by sucking the sap. Fifteen or twenty species do most of the damage in this climate. They are all minute. Some have wings and some are wingless. Those attacking the roots of plants and trees are as a rule blackish or bluish in color, while those infesting leaves and stems of plants and vegetables are generally greenish in color. There are exceptions but generally speaking the above color description holds. The color appearance is often changed by a covering of dust.

Those species which infest leaves will generally be found on the under side and in the process of feeding they roll or curl the leaves. One of the recent additions to this family is the Green Pea Louse. His body is about three-sixteenths of an inch long, spread of wings the same. His color is the same as the pea leaf which he makes his host.

The process of development of plant lice or Aphis is remarkable. The female lays her eggs in the fall, from which a colony of females hatch in the spring. These females give birth to live young without intervention of the male, which multiply so rapidly that the progeny of one female left undisturbed would reach several million in a season.

Preventive: Examine the roots of all shrubs or trees before setting. If you have a suspicion of lice or eggs in dirt clinging to the roots, mix the soil that is to be next to the roots with fine powdered tobacco (page 53) and moisten with water so as to make a "mush" before setting tree into it. Ants are fond of Aphis because these tiny insects furnish them with a sweet substance called honey dew, and in return protect and spread them from plant to plant in caring for them. To keep the ants down, band your trees and shrubs

CONTROL OF SUCKING INSECTS—Continued

(PLANT LICE OR APHIDS, SCALE INSECTS, ETC.)

with some sticky substance like tanglefoot. Put a collar of sticky fly paper one inch wide around your dahlias and similar plants. This will stop the ants.



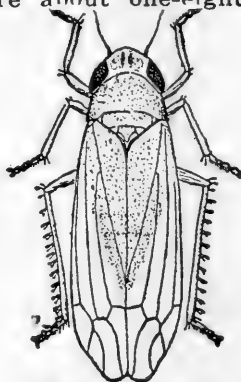
Aphis on Apple leaf

Remedy: Poisons are not useful against them. **Sterlingworth Kerosene Emulsion** (page 49), **Sterlingworth Whale Oil Soap with Tobacco** (page 47), **Sterlingworth Scale Killer** (page 50), **Sterlingworth Plant Lice Killer** (page 56), are all reliable sprays for those species which attack vegetables, shrubs and trees above ground, but we particularly recommend the last named for house plants. For those lice which attack the roots use **Sterlingworth Maggott Acid** (page 51), and **Sterlingworth Powdered Tobacco** (page 53).

Always spray the under side of the leaves. If leaves are rolled or curled dip them in the spray. Your spray or dusting powder must come in contact with the body to kill. For those lice which make the roots of the tree their host, like woolly aphis, soak the ground around plant with **Sterlingworth Kerosene Emulsion** (page 49) or **Sterlingworth Maggot Acid** (page 51).

LEAF HOPPERS. These insects are about one-eighth of an inch long, have blunt heads and are striped with yellow and red. They are quick long jumpers. They work on the under side of the leaves and by sucking the sap cause them to dry up and die. They hibernate in rubbish heaps, grass or any sheltered place during the winter; emerge in early spring and lay eggs just beneath the surface in clusters of eight to ten. From these the young white hoppers hatch in about two weeks.

They attack all kinds of plants, but principally the grape, and are hard to combat. An ounce of prevention saves weeks of spraying, so watch the under side of leaves and if the small, white young appear, spray quickly with **Sterlingworth Kerosene Emulsion** (page



Leaf Hopper

CONTROL OF SUCKING INSECTS—Continued

(PLANT LICE OR APHIDS, SCALE INSECTS, ETC.)

49) or **Sterlingworth Whale Oil Soap with Tobacco** (page 47).
ONION THRIPS. This insect is almost microscopic in size, and causes by its sucking injury to the onion known as silver top, white blight, etc. Entire fields of onions are often ruined by this species which also attacks various other garden plants.

Control: As soon as injury becomes evident, spray the plants with any one of the following remedies:—**Sterlingworth Whale Oil Soap with Tobacco** (page 47), **Sterlingworth Kerosene Emulsion** (page 49), or **Sterlingworth Plant Lice Killer** (page 56). Spray thoroughly, covering the plants as well as the ground just around them. It might be found desirable to repeat the operation in about a week's time.

OYSTER SHELL SCALE. These insects remain in the egg state under the female scale until about the first of June. They then appear as minute white crawlers. They settle and commence to penetrate the outer bark and suck the tree juices.

The adult scale can easily be determined by the shape of its back, which resembles an oyster shell. Poplars, Willow, Lilac, White Ash, and Apple are the plants most often infested seriously. To destroy—spray with **Kerosene Emulsion** (page 49) or a solution of **Sterlingworth Whale Oil Soap with Tobacco** (page 47) as soon as you see the young crawlers. If you spray regularly for San Jose Scale that spraying will take care of the Oyster Scale also.

RED BUGS OF THE APPLE. These insects have become quite prevalent in Massachusetts the past few years and their injury to the fruit and foliage of the apple is now not an infrequent occurrence.

The injury to the fruit is characterized by a stunting or puckering of the surface, accompanied by pits or depressions, due to the punctures made by the insects in feeding. The injury to the leaves is comparatively unimportant. The life cycle of the two common species of red bugs is very similar. The eggs hatch soon after the opening of the leaves of the fruit buds and the minute red nymphs at once begin to feed upon the tender leaves, usually causing clusters of small red dots by their punctures. As soon as the fruit sets, it is at-



Oyster Shell Scale
on twig

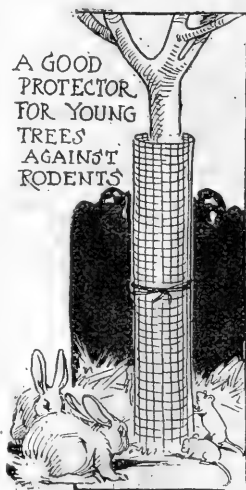
(PLANT LICE OR APHIDS, SCALE INSECTS, ETC.)

tacked and frequently injured to such an extent that it drops prematurely.

Remedy: If injury by these insects is suspected or has occurred during previous years, spray the apple trees thoroughly just before the blossoms open with **Sterlingworth Whale Oil Soap with Tobacco** (page 47) or with **Sterlingworth Kerosene Emulsion** (page 49). A second application may usually be made to advantage just after the blossoms fall, combining either of these materials with your codling moth spray. Red bugs are very wary and even in badly infested orchards are so agile in hiding that it is difficult to locate them.

"RED SPIDER." This is not a true insect but belongs to the spider group, being almost invisible to the naked eye. It has long been one of the most serious pests with which growers of greenhouse cucumbers and other plants have had to contend. It is estimated that greenhouse men in Eastern Massachusetts lose a total of no less than \$100,000 each year due to the destructiveness of this pest. Various fruit, ornamental plants, shade trees, etc., growing out of doors are also subject to injury, which consists of the extraction of the juices from the foliage, causing the leaves or stems gradually to dry up and die. All feeding is confined to the under side of leaves.

Control: Recent experiments conducted at the Massachusetts Agricultural Experiment Station have demonstrated conclusively that "Red Spider" can be controlled and injury to greenhouse cucumbers and other plants prevented by a thorough application of Linseed Oil Emulsion. **Sterlingworth Red Spider Emulsion** (page 53) is prepared according to the approved formula and with our facilities for manufacture, it will be found cheaper and more efficient than the home made emulsion. On plants growing out of doors which are less susceptible to spray injury, **Sterlingworth Kerosene Emulsion** (page 49) or **Sterlingworth Whale Oil Soap with Tobacco** (page 47) or **Sterlingworth Plant Lice Killer** (page 56) will be found effective. Spray the under side of the leaves and spray thoroughly. Begin spraying as soon as injury is evident. Don't delay.

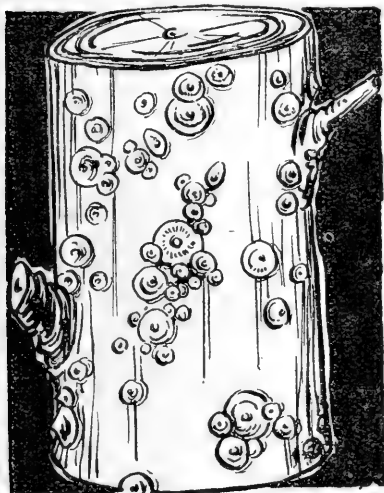


CONTROL OF SUCKING INSECTS—Continued

(PLANT LICE OR APHIDS, SCALE INSECTS, ETC.)

SAN JOSE SCALE (pronounced San Hosay) is the worst pest of the twentieth century. Recent investigations by Dr. Marlatt, of Washington, seem to prove quite conclusively that the original home of the San Jose Scale is in China.

The full-grown scale is about, the size of a pin-head round in shape and grayish-brown in color. It attacks bark, leaves and fruit. The part seen is not the insect but the shell or scale which covers it.



If the scale be lifted by knife or pinpoint, an orange-yellow speck may be seen, which is the insect. Each female produces in June or July, three hundred to five hundred young, which are born alive. The young rest on the bark and feed on the sap through the beak. They mature and produce young in about a month. It is estimated that a single female produces upwards of three billion insects in a single year.

The light-colored scales about the diameter of a common pin which have just settled down, as well as somewhat larger and darker scales about the size of a small pin-head,

may perhaps also be observed against the smooth bark on young wood. When the bark becomes quite thoroughly covered with the scales it assumes a rather rough, scurfy appearance of an ashy-gray color. When rubbed with the hand, or better, with the thumb-nail, a yellowish liquid appears, due to the crushing of hundreds of insects. This liquid gives a greasy feeling to the bark where it has been rubbed. On very young wood, especially if of a bright greenish color, the scale will be surrounded by a reddish discoloration. This is true also on fruit, and of course it shows best on green fruit and on light-colored varieties. Care must be used, however, not to confuse the red spots formed by fungous diseases, such as *Entomosporium maculatum*, with those of the scale.

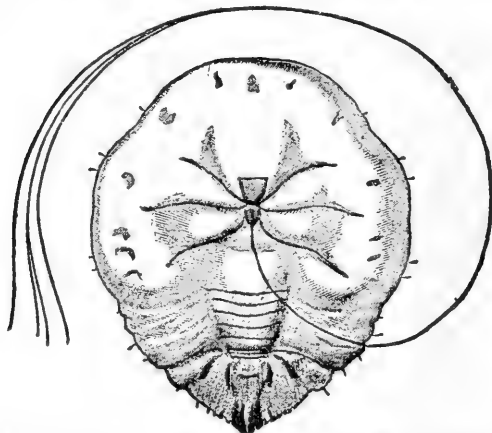
If the outer bark, even though dark and showing no dis-

CONTROL OF SUCKING INSECTS—Continued

(PLANT LICE OR APHIDS, SCALE INSECTS, ETC.)

coloration, be stripped off so as to disclose the inner green-colored portion, this will also be found discolored in the same way as described above, if the scale is present.

Remedy: Agricultural Experiment Stations recommend Lime and Sulphur Wash Sprays and Miscible Oil Sprays, as the most satisfactory.



Underside of female scale insect, showing proboscis or sucking tube. Greatly enlarged—After Howard, U. S. Dept of Agr., Bur. of Ento.

and large limbs with **Sterlingworth Whale Oil Soap with Tobacco** (page 47) and spray the leaves with a light application of either **Sterlingworth Scale Killer** (page 50) or **Sterlingworth Kerosene Emulsion** (page 49). This will hold the scale in check until you can treat when tree is dormant with **Sterlingworth Scale Killer** or **Sterlingworth Lime and Sulphur Wash**. This pest attacks all fruit trees, many shrubs and vines and some shade trees.

SPRUCE GALL LOUSE. Injury by this pest results in the formation of somewhat cone-like, many-celled galls of about three-quarters of an inch in length, usually accompanied when the infestation is bad, by a more or less severe dropping of foliage. Norway and white spruce are attacked

These should be applied in the fall or winter when the tree is dormant, or in the early spring, and in case of badly infested trees in both fall and spring. For a quick, effective remedy when you can spray but once and must give the tree prompt relief we recommend **Sterlingworth Scale Killer** (page 50). Where you can spray regularly use **Sterlingworth Lime and Sulphur Wash** (page 46).

If you discover your trees are infested after the leaves have sprung, paint the trunks

CONTROL OF SUCKING INSECTS—Continued

(PLANT LICE OR APHIDS, SCALE INSECTS, ETC.)

most. There are two broods of these gall lice each year, but only one of these makes galls. The eggs of the first generation are laid about the middle of May in clusters on the spruce bark. These eggs hatch in about a week and the young crawl about and finally settle down at fresh galls just started by the parent gall lice. As the galls develop they gradually close over these insects, leaving them in small chambers surrounded by the outer partition of the gall. Early in August the insects become full grown and about this time the galls, which have previously been green, turn yellow, dry and split open, permitting the full grown lice to escape. The latter part of August the eggs of the second brood are laid. These hatch late in the fall and the young pass the winter in protected crevices of the bark, continuing their development the next spring.



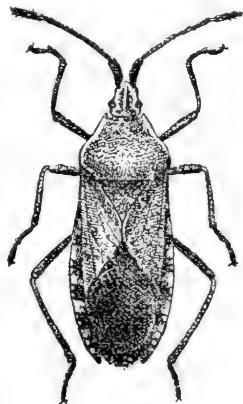
GALLS OF SPRUCE
GALL LOUSE

oughly. **Sterlingworth Whale Oil Soap with Tobacco** (page 47) or **Sterlingworth Kerosene Emulsion** (page 49) will control this insect. The proper time to spray is during the month of April, the earlier the better. Don't delay. After the galls start to form, spraying is useless. Cutting off and burning the galls in June will help control this species but this is hardly practicable except in the case of a few small plants.

SQUASH BUG. The mature squash bug is of a gray-black color and slightly over a half inch long. The younger bugs are of a gray color and usually feed in groups on the under side of the leaves. The eggs are brown and are laid in clusters on the under side of the leaves. Injury consists in the extraction of the juices of both leaves

Control: Success in the control of

this insect means spraying with the proper material, at the proper time and spraying thor-



Squash Bug

CONTROL OF SUCKING INSECTS—Continued

(PLANT LICE OR APHIDS, SCALE INSECTS, ETC.)

and stems by all stages of the insect from the young to the adults. Serious infestation often results in the death of the plants in a short time.

Remedy: Place pieces of boards, shingles, etc. among the plants. The adults will seek shelter under these at night, where they may be found after dark or in the early morning, and destroyed. Destroy the eggs whenever these are found. The best way is to cut out the small section of the leaf bearing them and burn it. These remedies are, of course, practicable only over small areas. Spray the young bugs with **Sterlingworth Whale Oil Soap with Tobacco** (page 47) or **Sterlingworth Kerosene Emulsion** (page 49). Each bug must be hit by the spray. While the plants are still young, keep them well cultivated and use a fertilizer to make them grow vigorously. Dust the plants thoroughly while young with air-slaked lime. This will repel the bugs and they will search for plants elsewhere upon which to lay their eggs. As soon as the crop is gathered, rake up the plants, allow them to stand for a day so that the bugs can collect on them again, and then destroy bugs by spraying with kerosene oil.

CONTROL OF SUBTERRANEAN INSECTS

THESE insects work in the soil and are perhaps the most difficult of all to control, since they are not easily reached and direct methods of control are not always practicable. Subterranean insects feed both by biting off, chewing and swallowing solid food, and by piercing and sucking, according to the species.

GRAPE ROOT WORM. The mother beetle appears at blossom time, feeds a little and lays from one hundred to five hundred eggs on the bark. They hatch in two weeks. The young larvae, which are about one-sixteenth of an inch long, drop to the ground and commence to grope around in search of food. Upon locating the vine trunk they work themselves down to the roots and feed. The larvae hibernate deep in the ground. In the spring they come near the surface, form an earthy cell and change into a beetle.

Remedy: Spray with **Sterlingworth Arsenate of Lead** (page 49). Immediately when the beetles appear—before
Page twenty-eight

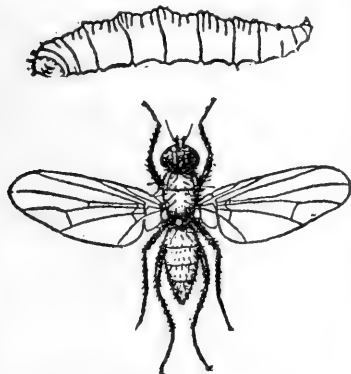
STERLING CHEMICAL CO., CAMBRIDGE, MASS.

CONTROL OF SUBTERRANEAN INSECTS—Continued

they lay eggs—agitate the ground by cultivation when larvae are near top of ground.

LETTUCE EARTH-LOUSE. A cream-colored louse with short legs, extracts the sap from the roots of the lettuce below ground. For a remedy use **Sterlingworth Maggot Acid** (page 51) around stems.

ROOT MAGGOTS. There is a large number of these pests but they all have the same contemptible destructive disposition. These maggots "railroad" your radishes and turnips, and make the roots of your cabbages and cauliflower look mostly like holes. This is one of the meanest garden pests. You never see him or his work until the damage is done. Preventive measures are best. Always sprinkle a ring of **Sterlingworth Powdered Tobacco** (page 53) around your Squash, Cucumbers, Melons, Carrots, Radishes and Turnips as soon as they are up. When transplanting cabbages do the same, or better still place a **Sterlingworth Tarred Felt Disks** (page 51) about each plant. This helps keep off the fly that lays the egg. Make a practice of digging around the roots of those vines favored by this insect every few days and



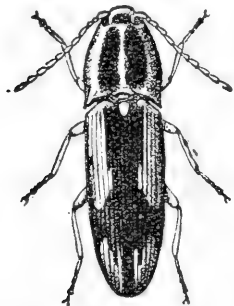
Cabbage Root Maggot
Fly and Larva

if you have suspicion that he is at work apply **Sterlingworth Maggot Acid** (page 51) at once. If you find your vines wilting don't lay it to drought or something else, look for root maggots and if you find them, treat all your vines with Maggot Acid or be prepared to lose your crop.

WHITE GRUBS. These are without doubt the most destructive pests with which the strawberry grower has to contend and various other crops, such as corn, potatoes, grains, grasses, etc., are frequently injured. These large, thick bodied, curved, whitish grubs are the young of the May Beetle or "June Bug," and require two years for their growth and change to the adult beetle.

Treatment: The parent beetles prefer to lay their eggs in sod land or in land poorly cultivated and weedy. Crops such as strawberries, corn, potatoes, etc., should not follow

within two years land that has been in sod, since, owing to the lack of food, the grubs concentrate upon the roots and soon kill them. Clover, beans, peas, etc., are not injured to any great extent by white grubs and may be grown to advantage as a two year intervening crop between sod and strawberries, corn, potatoes, etc. Nothing can be done to prevent injury to plants after it has been started.



Wire Worm Beetle
and Larva

WIRE WORMS. These are the young of a "click" or "snapping beetle." They are usually yellowish-brown in color, about three-fourths of an inch to an inch long, slender and quite hard, and are especially injurious to corn and potatoes.

Remedy: Little can be suggested in the way of a remedy for these pests. The mid-summer cultivation of fields already planted will destroy many of the insects in their pupa cases at this time, and the plowing in mid-summer of fields in sod which are to be planted another season will greatly reduce injury by these pests. Various insecticides which have been experimented

with up to the present time have proved useless from a practical standpoint.

MISCELLANEOUS INSECT PESTS

OUR CREATOR after making Man, seemed to feel that he was likely to be a "lazy cuss," and to keep him in motion and in a healthy, active state, turned seven million insect pests loose in his cave with the injunction to sting, suck, eat, drink and be merry, and ever since then Man has been swatting flies, chasing fleas, killing lice and hunting bed bugs.

Man has certainly had to "sit up and take notice," do a little scratching and then keep on taking notice and doing a lot more scratching to keep ahead of these enemies. Between his nightly battles with the mosquito who pumps disease

MISCELLANEOUS INSECT PESTS—Continued

into him and the bed bug who sucks blood out of him and a multitude of other insects who keep him on the move to protect his property daytimes the original plan for "motion" and "activity" has worked out perfectly.

THE MOSQUITO. This is a real "honest to goodness" dangerous pest. Never allow one to bite you if you can help it. Kill him as quick as he lights. Don't wait to see how he works "his auger." Kill him. Just think of a mosquito satisfying part of his appetite on a big fat black water snake and finishing out on you. Never visit or live in a place where there are mosquitoes, if you can avoid it. You cannot tell a malarial mosquito from any other, except by close examination and disease is about sure to result if one of them punctures your skin. You would not intentionally let a mad dog or rattlesnake bite you. Take the same precaution against mosquitoes. Cover all stagnant water with oil. Permit none to stand on your premises or on your neighbors' if you can help it. Mosquitoes always breed in stagnant water. This applies to water in eave troughs, cisterns, barrels, sink drains, cess pools, ditches, swamps, etc. Keep your houses screened and protect the toads and insect-eating birds.



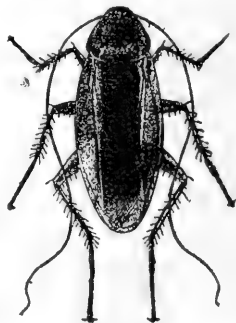
Biting House Fly
or Stable Fly

THE FLY. The fly is more dangerous than the mosquito, a lot more filthy and is with us a longer period of the year. He breeds in filthy places, and then walks over your food and wipes his feet on your skin. He can carry more disease and plant it more quickly than any other insect created. Typhoid fever, tuberculosis, cholera, dysentery, small pox, leprosy, are a few of the diseases he dispenses. **Swat him.** **Catch him** in traps, destroy his breeding places. Don't buy milk from any one who does not take precautions to keep flies out of the barn at milking time. Screen your homes, cover the garbage can, destroy the fly maggots breeding in the out-of-door water closets by a treatment every two weeks

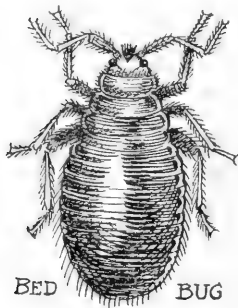
during the late spring, summer and early fall, with borax water at the rate of three-fourths of a pound of borax to ten gallons of water. In manure piles and hog pens, where about 95 per cent. of house flies breed, spray the manure and straw at least every two weeks during the fly season with good fresh **Sterlingworth Hellebore** (page 54) solution, at the rate of one-half a pound of the Hellebore to ten gallons of water, extracting the Hellebore in solution for 24 hours before ap-

plication. Borax solution is also very effective, but is dangerous to plant life where the manure is to be used as a fertilizer. See that the ground around the pile for a yard or two is given a good drenching also. Many of the maggots come out here to change to pupae. Spray horses and cattle with **Guaranteed Cattle Oil** (page 55).

ROACHES AND WATER BUGS. These insects live in the most filthy places imaginable. Sink drains, cess pools and garbage cans are favorite "residential sections." They are nocturnal in their habits and do their crawling at night. After thoroughly inspecting the sink spout and garbage can, they start out loaded with filth in search of food. Your food is theirs, so they head for your pantry. They creep over your pastry, crawl through your packages of cereal and burrow in the contents of your flour barrel, leaving a trail of sink filth and disease behind them. They have just one redeeming feature—they eat bed bugs. You seldom find a large number of bed bugs where there are many roaches. Perhaps that sickness that laid you up last year or came near being fatal to "the little one" was caused by one of these pests. It is no disgrace to have roaches, for they may



The Roach



BED BUG

be brought in from many different sources over which you have no control. The disgrace is in keeping them. It is not hard or expensive to exterminate them and **Sterlingworth Roach Killer** (page 69) will do the work. As a preventive keep all food tightly covered—keep the sink clean and cut off every source of food supply. They will leave your premises if you don't furnish them food.

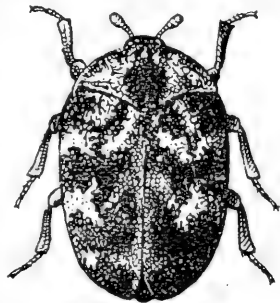
BED BUGS. These are so familiar in song and story that they do not need any description. If you can't see them you can generally detect their odor. They may be brought in on your clothes, in the laundry, the grocery baskets or

on the dog. It is no disgrace to have them. The disgrace is

MISCELLANEOUS INSECT PESTS—Continued

in keeping them. Their habits of concealment, infrequency of feeding, nature of their food which consists of human blood and members of their own tribe, make them hard to combat. The **Sterlingworth Bed Bug Preparation** (page 68) and persistence will be found as effective if it can be used. Closing infested rooms tightly, burning sulphur candles (page 52) and thus subjecting the rooms to a fumigation for a period of at least 48 hours will aid materially.

THE BUFFALO BUG. This is another bug that has recently crawled into the limelight. He came from Europe, and made himself at home at once. He is harmless with the exception that his specialty is eating carpets, at which trade he works industriously. He is a broad, oval-shaped beetle, almost a quarter of an inch long, with a red stripe down the middle of his back. Eternal vigilance is the best remedy. If you use rugs on the floor occasional cleaning is a protection, but in the case of carpets which are not often taken up, close watching is necessary. It is claimed by some that strong, fine powdered tobacco sprinkled around the floor before the carpet is tacked is a preventive.



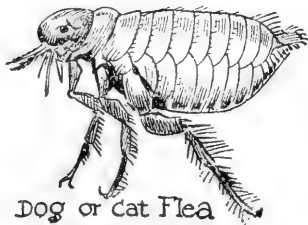
Buffalo Bug



THE ANT. They are the classiest "bug" in the insect kingdom. They rank in almost the same order of intelligence as Man. They are wonderfully active, and the stunts they do would make suitable material for a moving picture show. The only sure way to keep them off your premises is to dig a canal around your property and fill the canal with water. There are about fifteen thousand species, of which five thousand have been classified, but the housewife knows just two—"the big black fellow" that tunneled the custard pie the day that the minister came to tea, and the little red fellow who pulled the cork out of the molasses jug and crawled in. When not chiseling into the sugar bucket they are out in the lawn cutting off grass roots and making ant hills. You seldom see many ants

where there are plenty of toads. Put a toad down where ants are plenty and watch the fun. If you keep food covered and crumbs brushed, it helps to keep ants out of the house. **Sterlingworth Ant Driver** (page 67) is right for ants in houses and **Sterlingworth Ant-i-cide** (page 57) is for ants in lawns.

THE FLEA. When David Harum said, "A reasonable amount of fleas is good for a dog —they keep him from broodin' on being a dog," he didn't know what he was talking about. Either David never had fleas or they didn't like the taste of his skin and did not bite him. At any rate, one good healthy energetic flea in full possession of his faculties can keep a family of fifteen, including the cat, dog and goat, guessing and scratching and miserable. They never



Dog or cat Flea

play fair, they jump so quick you can't get a good square lick at them. We haven't a thing to suggest for them on human beings. For dogs and cats **Sterlingworth Flea Killer** (page 69) is satisfactory.

RATS AND MICE. The "rat problem" is one of the most serious that ever confronted man. A single pair will increase, if left unmolested, to twenty millions in three years. His bill of fare includes almost everything eaten by man and a number of articles not included in the human dietaries; for instance, mice, living horses' hoofs, kid gloves, shoes and paper. It is estimated that a single rat will eat 60 cents' worth of grain in a year if fed on that alone.

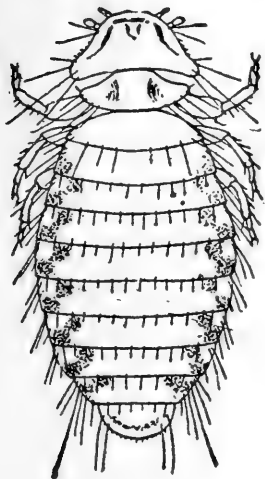
The damage they do is not measured wholly by what they eat. Through pollution of food products, they do as much damage as by eating. Their energetic habits of digging under buildings, through embankments, gnawing wood, cutting holes in sacks, tearing up papers to make nests, add to their list of depredations. The killing of young chickens and fowls, and the stealing of eggs have brought them into disrepute among poultrymen.

They distribute disease and their well known fondness for matches has resulted in many disastrous conflagrations. They must be exterminated wherever found. There are innumerable receipts for driving them; singeing their hair off, tying a bell around their necks, or painting them red and white and turning them loose among their friends, are all supposed to be sure drivers, but we have always noticed that the fellow who had the most "dead-sure" receipts had the

most rats. We believe that cats, traps and Rat Killers offer the surest solution. For a poison that generally acts without unpleasant results, one not likely to injure human beings or pets, try **Sterlingworth Rat Killer** (page 67).

There are a score of other pests that at times make the housekeeper wish she was not. Among them are cheese mites, clothes moth, ham beetle, yellow-jackets, fish moth, meal worm, punkies, but they are rather infrequent and do not often carry contagion, or do much damage.

POULTRY LOUSE. There are a number of species of this particular enemy of the poultrymen. Some poultrymen who have fought them claim there are at least a million different and distinct species. What lice do to offset the efforts of the Women's Anti Egg Trust Clubs to keep down the high cost of eggs is a shame. They are the personification of persistency boiled down. They feed upon scales of the skin, hairs, feathers, etc., and cause the poultry to become sickly because of their irritation. Success with poultry and lice never occupy the same poultry house at the same time. If your fowls are lousy either kill the lice, kill the fowls or quit the poultry business.



Poultry Louse

Preventives and Remedy:

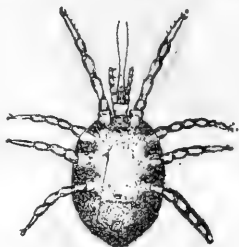
Powders are most effective against this pest, for the lice remain on the fowl's body and are not easily reached by fluids. There is a different Lice Powder for every ten square miles in the United States. No doubt an occasional infirm louse about ready to "pass out" is helped "on his way" by some of the stronger powders, but it is a waste to

spend money on a large proportion of the Lice Powders offered for sale. Don't buy a powder that does not kill the lice so you can brush them out of the fowl's feathers or so you can see them fall dead from the fowl. Don't think because it is called Lice Powder it will kill lice. Let your eye prove its efficiency (page 63).

CHICKEN MITES. These mites are just as fatal to success with poultry as poultry lice. They are nocturnal in their habits. They seclude themselves in the cracks and crevices of the poultry house daytimes and at night attack the fowls while they are roosting. They subsist upon blood and no fowl

can meet the demands made upon her for blood by this thirsty blood sucker, retain her health, and do her duty as an egg producer. No poultryman can afford to feed mites with blood generated from feed at the present high prices.

Remedy: Get after them in the cracks and crevices where they live day-times with a good strong liquid lice and mite killer. The stronger the better. Use a fluid that has evaporating qualities and throws off a vapor. The vapor from such killers penetrate where the fluid would not, and helps kill. Do not attempt to fight them with watery mixtures, kerosene, etc. They are worthy of your most energetic and constant attention (page 62). A little crude carbolic acid mixed with the whitewash used when spraying your hen house helps as a preventive.



Chicken Mite

FUNGOUS DISEASES

FUNGIOUS diseases are unlike insects that you can see and crush between two bricks. They are caused by microscopic, parasitic plants which live within the tissues of higher plants and obtain their sustenance from them. These parasites produce a diseased condition on the plant that harbors them. Plants that entertain fungous parasites are called host plants. There are few vegetables, plants or trees that are not host plants for at least one species of fungi.

The injury from fungi is as serious as from the eating pests but the cause is invisible and only the result can be seen. The materials mostly used in fighting it are Lime, Sulphur, Copper, Ammonia or Iron. Treating plants that have been attacked helps some, but far better results are obtained by anticipating the trouble and getting in preventive work first. Generally speaking fungous preparations should be considered as preventives rather than remedies. Crops like potatoes should not be planted unless you plan to spray them. No good first quality fruit should be expected unless you spray for the various fungous diseases to which they are subject. Spraying for fungi costs nothing as the additional increase in crop and better fruit and vegetables more than pays the bill.

The following are some of those prevailing fungous diseases at this time affecting the most important crops.

ANTHRACNOSE. Attacks nearly all fruit and vegetables in some form. It appears most frequently on the bean, attacking both pod and leaf. Cucumbers and melons are also favorite host plants. Its presence is indicated by unsightly spots on the leaf. **Preventive:** Plant seed free from disease.

Remedy: Spray plants when three inches high with Bordeaux Mixture (page 45) and repeat in two weeks and again after plant blossoms. Do not cultivate, walk through the rows or pick beans while wet with dew or rain. The disease is easily spread in this way.

APPLE SCAB. This disease shows itself early. A cold, rainy season is most favorable for this scab fungus. It can easily be determined by the almost black, dark-green, circular fuzzy spots on the fruit. The infected fruit many times drops before maturity, sometimes cracks open and is often badly out of shape.

Preventive:

Spray with **Sterlingworth Liquid Bordeaux** (page 45) as the buds open and again just

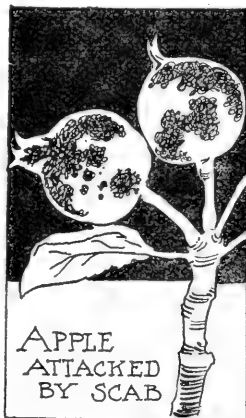
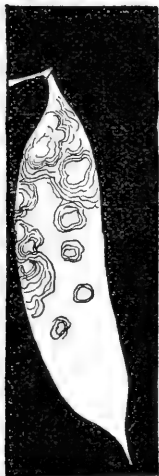
Anthracnose
on Pea Pod

after petals fall. Use **Sterlingworth Ar-Bo** (page 48) at this second application and with one spraying get after both the codling moth and apple scab. **Sterlingworth Lime and Sulphur Wash** (page 46) may be used as a substitute for Bordeaux.

BLACK KNOT. This disease attacks the plum mostly. Swellings on the limbs and twigs appear like bunches of hard, rough black warts.

Remedy and Preventive: We know of no sure remedy or preventive but believe Bordeaux sprayings are helpful. Look the tree over when leafless and cut off all knots and burn them.

*See qualifying statement regarding all of Bordeaux and Copper Mixture pages 44-45-46-47.



FUNGIOUS DISEASES—Continued

BLISTER RUST: This is a disease of the white pine and other pines with needles in groups of five. The disease is native to Europe but was introduced into the United States several years ago on infested pine nursery stock. It has now become established in this country and offers a serious menace to the growth of white pine. The fungus parasite requires two host plants to complete its life cycle, the pines mentioned being one host and currants or gooseberries the other. The disease develops in the wood of the pine from spores from infested currant or gooseberry plants, upon which only the leaves are attacked. The disease once started in a pine gradually kills the parts attacked and eventually the tree itself. The fungus fruits in the spring, usually in April or May, upon the pine and breaks out as small orange colored patches surrounded by a white papery envelope. These orange spores are blown about by the wind and in turn infect any currant or gooseberry plants which happen to be within several hundred feet, causing a brownish rust upon the under side of the leaves. Thus the cycle continues. **One pine cannot infect another. The disease must spread to currants or gooseberries and then back to pines.** If you know of or suspect the existence of this disease either on your own premises or the premises of others, communicate

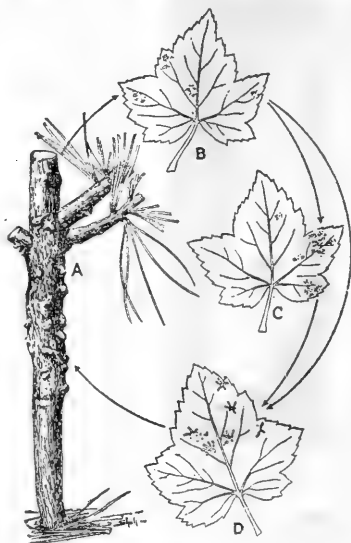


Fig. 1.

Fig. 1.—Diagram indicating the life circuit of the causal fungus of the white-pine blister rust. a, Blisters on pine in May and early June, from which the disease spreads to currant or gooseberry leaves and produces the early summer stage, b; thence it may spread to another currant leaf and produce there a second crop of the early summer stage, c, or it may produce the late summer stage, d; in this stage, in the fall, it infects neighboring white pines, which may or may not include the pine (a) which bore the blisters that started the outbreak the preceeding spring. Bulletin 742 (U. S. D. A.)

FUNGIOUS DISEASES—Continued

at once with your State Agricultural Experiment Station, accompanying your information with specimens if possible. Every one must do his part to stamp out this disease.

Remedy and Preventive: Once the disease is established in a neighborhood, the only salvation of the pines lies in the destruction of all currant and gooseberry plants within five hundred feet of the infected pines, to prevent the infection from spreading. Infected twigs, branches, and the trees themselves, in severe cases, should be cut and burned.

BROWN SPOT. This disease seems to attack the Baldwin exclusively and make the fruit look as if specked with small rotten circular spots.

To Prevent:* Spray with **Sterlingworth Bordeaux**—the same as for Apple Scab.

CANKER. This disease attacks nearly all fruit trees, and should be given prompt attention as soon as it appears.



Remedy: When it appears scrape off all loosened bark near the seat of the trouble. Cut out and burn small branches affected. Cover wounds with melted asphaltum after first disinfecting with corrosion sublimate solution 1 part to 1000 parts water and dig out the canker sores. We know of no reliable preventive measure.

CHESTNUT BLIGHT. This disease, also of foreign origin, has for a number of years been killing thousands of chestnut trees in Eastern United States. The infection is spread

from tree to tree by the agency of the wind, birds, insects. It will probably be years before this disease runs its course, and it is hoped that in time a variety of chestnut resistant to the disease will be developed and thus prevent this valuable tree from being exterminated.

Control: Nothing can be suggested other than to cut and utilize chestnut timber as soon as a tree shows evidences of the disease.

DOWNY MILDEW AND BROWN ROT. When this disease attacks fruit it is called Brown Rot, and when it attacks leaves—Downy Mildew. As Downy Mildew it attacks melons, cucumbers, squashes and grapes. You can detect it by the mouldy yellow spots on the underside of the leaves. These spots after a short time turn brown. The leaf wilts, dies and drops to the ground. When the disease **appears** get busy. A few hours' delay may mean the difference between a crop and no crop.

See qualifying statement regarding all of Bordeaux and Copper Mixture pages 44-45-46-47.

FUNGIOUS DISEASES—Continued

Spray with **Sterlingworth Liquid Bordeaux** (page 45) to hold it in check and confine it to plants already infested.

GRAPE BLACK ROT. The first warning is in the form of brown spots on the leaves and soon after the grapes turn dark and shrivel up.

Remedy: Use **Sterlingworth Liquid Bordeaux** (page 45), or **Sterlingworth Dry Bordeaux Fungicide** (page 46).

LEAF SPOT. This disease shows itself in form of small circular brown spots on the leaves. It attacks most all stone and pome fruits. We know of no certain safe remedy. **Sterlingworth Liquid Bordeaux** (page 45) is suggested as a preventive.

OAT SMUT. This disease attacks all grains and is sometimes called Bunt or Black Head. The last name describes its appearance. Soak seed in **Sterlingworth No Scab** (page 61)

PEACH LEAF CURL. Crinkley, puckered leaves, taking a powdery appearance later on, is indicative of this disease. The leaves turn yellow and fall to the ground. As a preventive we recommend **Sterlingworth Lime and Sulphur Spray** (page 46) early in the spring before the opening of buds. Some growers prefer Bordeaux sprays.

PEACH YELLOW. Fruit from trees infested generally ripens early and has reddish-yellow streaks running from skin to the pit. Peculiar yellowish sickly shoots sprout from the old wood. This is an extremely contagious disease for which no cure is known. Burn the tree where it stands and scatter lime liberally on the ground covered by the tree to kill spores and disinfect the soil. Be particular to burn trees where they stand. You may distribute the disease if you move them. Remember this is as contagious among trees as small-pox is among human beings.

POTATO EARLY BLIGHT. Appears as dark, blackish spots on the leaves which rapidly grow



Black Knot on
Cherry Twig



LOOSE SMUT
ON HEAD OF
OATS

appears as dark, blackish spots on the leaves which rapidly grow

FUNGOUS DISEASES—Continued

larger and eventually kill the plant. Look for this in July, especially if weather is damp.

Preventive: Spray with **Sterlingworth Liquid Bordeaux** (page 45) every two or three weeks from about July 10th to August 15th. If you spray with **Sterlingworth Ar-Bo** (page 48) this spraying takes care of bugs and blight at the same time.

POTATO ROT AND LATE BLIGHT. This disease shows itself as a whitish mold on the under side of the leaves. When you see this look out for rotting potatoes. Use the same preventive for this as for Early Blight.

Spraying potatoes for fungus costs nothing, as the increased crop pays liberally for time and materials. Spraying is part of "the game" the same as hoeing. Buy your materials when planting so as to have them on hand. This applies to both the gardener with fifty hills and to the large raiser with fifty acres.

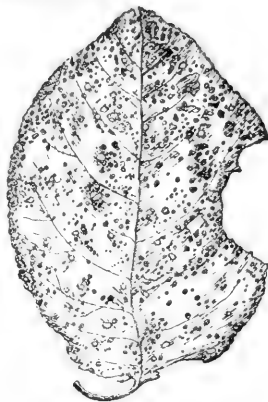
POTATO SCAB.

This causes rough, scabby potatoes. It is usually prevented by soaking the seed in **Sterlingworth No Scab** (page 61). Never plant potatoes on soil that has raised scabby potatoes. Never use seed unless you sort it. The additional crop more than pays for the trouble and expense.

SOOTY SPOT. Looks something like Scab but is not so fuzzy, more like an ink spot or paint stain and makes the fruit dirty. We do not know of a certain remedy but believe a spraying with Bordeaux when the fruit is about one-fourth grown helps. Attacks apple mostly.

SHOT-HOLE FUNGUS. This is a very destructive disease to the plum. This same fungus attacks the cherry. It sometimes completely defoliates the tree and practically ruins the fruit.

Remedy: Spray with **Sterlingworth Liquid Bordeaux** when leaves are half grown and again in two weeks.



Shot-hole Fungus
on Plum Leaf



CONDENSED SPRAYING CALENDAR

Reference numbers refer to pages on which information on what to use and when to use, may be found.

Plant or Tree	Disease or Insect	Description	Remedy
APPLE	Red Bugs	23	47-49
	Scab and Rust	37	45-46-48
	Brown Spot	39	45-46-48
	Codling Moth	9	48-49
	Flat Head Borer	14	47-50
	Bud Moth	7	48-49
	San Jose Scale	25	46-47-49-50
	Aphis or Lice	21	47-49-50-51-53-56
	Oyster Shell Scale	23	46-47-49-50
	Sooty Spot	41	41
	Curculio	10	48-49-11
	Round Head Borer	18	47-50
	Maggot	5	5
	Canker Worm	8	48-49
	Tent Caterpillar	19	48-49
	Canker	39	39
ASPARAGUS	Rust	-	48
	Beetle	6	49-6
BEAN	Anthranose	37	45-46
	Leaf Spot	-	45-46
BLACKBERRY & RASPBERRY	Anthranose	37	45-46
	Rust	-	45-46
CABBAGE and	Aphis	21	49-56
	Root Maggot	29	51-53
CAULIFLOWER	Cabbage Worm	8	54
	Cabbage Looper	8	54
CHERRY	Brown Rot	39	45
	Curculio	10	11-48-49
	Leaf Spot	40	40
CORN	European Borer	13	13
	Wire Worms	30	30
	White Grubs	29	30
CUCUMBER	Downy Mildew	39	45
MELON	Squash Bug	27	47-49
SQUASH	Beetles	-	48
WATERMELON	Root Maggot	29	51-49-53
	Vine Borer	18	18-19
CURRENT	Worms	-	54-49
GOOSEBERRY	Mildew	-	44-45-48
GREENHOUSE PLANTS	Red Spider	24	47-49-53-56
GRAPE	Brown Rot	39	45
	Downy Mildew	39	45
	Flea Beetle	14	45-49

CONDENSED SPRAYING CALENDAR—Continued.

Plant or Tree	Disease or Insect	Description	Remedy
GRAPE	Leaf Hopper	22	47-49
	Rose Chafer	17	48-54
	Root Worm	28	49
GRAIN	Smuts	40	61
LETTUCE	Earth Louse	29	51
ONIONS	Thirps-Blight	23	47-49-56
PEACH	San Jose Scale	25	46-47-49-50
PEAR	Borers	16-17-18	16-17-18-47-50
PLUM	Shot Hole Borer	18	18
	Leaf Curl	40	46
	Yellows (Peach)	40	40
	Bud Moth	7	8-48
	Pear Psylla	—	50
	Slug	—	48
	Codling Moth	9	48-49
	Curculio	10	48-49-10
	Black Knot	37	37
	Shot Hole Fungous	41	45
	Blister Rust	38	38-39
PINE	Aphis-Lice	21	47-49-50-51-53-56
	Early Blight	40	45-58
	Late Blight-Rot	41	45-48
	Beetle (Potato Bug)	17	48-49
	Flea Beetle	14	45-48
	Scab	41	61
	White Grubs	29	29-30
	Rust	—	45-46-48
QUINCE	San Jose Scale	25	46-47-49-50
	Leaf Blight	Liquid Bordeaux	when buds appear
	Root Maggot	29	51-53
RADISH	Plant Lice	21	21-22
ROSE	Rose Scale	Remove badly infested twig	
	Rose Slug	—	49-48
	Rose Bug	17	48-54
	Red Spider	24	56-49-47-53
	Rust Leaf Blight	—	45-46
STRAWBERRY	White Grubs	29	29-30
	Borers	18	18-47-50
SHADE TREES	Elm Leaf Beetle	12	49
	Tussock Moth	20	51
	Brown Tail Moth	6	49
	Gypsy Moth	14	51-49
	Leopard Moth	16	16-50
	Spruce Gall Louse	26	27-47-49
	Cut Worms	12	52-12
TOMATO	Worms	20	49

BORDEAUX MIXTURE

WHAT IT IS AND ITS USE

BORDEAUX MIXTURE is a fungicide, made by combining the Milk of Lime with Copper Sulphate. It derives its name from having been first used in or near the city of Bordeaux, France, and is considered by many the most reliable and effective remedy for most fungous diseases infesting vegetation.

The value of **Bordeaux Mixture** cannot be over-estimated. But it must be properly prepared from suitable materials. Some recommend the use of equal parts of Lime and Copper Sulphate in making, but we believe that most authorities recommend the use of a quantity of Lime slightly in excess of the Copper Sulphate, especially if it is to be used in combination with a poison.

Its use prevents or controls certain Scab, Leaf Spot and Sooty Mold of the apple, Anthracnose of the Bean, Blackberry, Raspberry and Grape, Leaf Spot of the Beet and checks the ravages of the Flea Beetle, many of the Rusts, Leaf Blights of Currant and Gooseberry, Celery, and Pear Blight, Downy Mildew of the Cucumber, Melon and Squash, Potato Blight, Black Knot, Shot-hole fungus; also many Fungous Diseases, Blights and Leaf Spots that attack Shade Trees.

Primarily it is a fungicide, but when combined with a poison, as Paris Green, Arsenate of Lead, London Purple, calcium arsenate, etc. (see **Sterlingworth Ar-Bo** page 48), a valuable mixture is obtained which in addition to the fungicidal properties kills and controls Bud Moth, Canker Worms, Codlin Moth (which make your apples wormy) Curculio moth, Asparagus Beetles, Cabbage Worms, Slugs, Currant Worms, insect attacking Cranberries, Striped Cucumber Beetle, which attacks your Squash, as well as Cucumber vines, Squash Bugs, Flea Beetle on Grape and Potato vines, Rose Bug, Potato Beetle (potato bug), etc. It may be used as a liquid or Dry Powder. We believe the liquid form is the best for most purposes.

It is a compound of remarkable adhesive properties. When it becomes dry on the foliage, it resists excessive washings of rain for some time.

Bordeaux is a remedy and it is for use as a preventive rather than a corrective. One thorough spraying at the right time is worth more than ten careless treatments. Almost any of the spray pumps will do the work satisfactorily. The spray should be sent against the vegetation in a fine mist with some force. If a spray pump is not available, it may be applied with brush and pail. Early applications on the apple

(Continued on Page 45)



STERLINGWORTH LIQUID BORDEAUX

FOR
CERTAIN
FUNGIOUS
DISEASES

It may be combined with a poison when desired (full directions are on the can), so combined it becomes a combined Fungicide and Insecticide, and kills many eating insects as well as remedies most fungous diseases, but for a combined insect killer and fungous

remedy we recommend **Sterlingworth Ar-Bo** (See page 48).

The selection of materials used in the manufacture of **Sterlingworth Liquid Bordeaux** is made with great care, and the resulting combination has given satisfaction for over 10 years. Careful selection of materials and great care in its preparation are essential to greatest success. The kitchen gardener and small grower will find it more satisfactory to buy his Bordeaux ready to use than make it himself and many large users find that it is cheaper to buy the ready-made material when he figures the cost of the labor and the utensils spoiled in making it.

Sterlingworth Liquid Bordeaux is about the consistency of putty or paste. One gallon makes from 10 to 50 gallons (depending for what purpose it is to be used) of mixture ready to use by adding water. Explicit directions for use on every can tell how to use it on each kind of vegetation. If you only have one grape vine or one fruit tree or a 100-square-foot garden you can afford to spray. You cannot get the best fruit or vegetables unless you use a fungous preventive.

PRICES: 1 qt. cans 40c. each, mailing weight 4 lbs.; 1 gal. cans \$1.25 each, mailing weight 13 lbs.; 5 gal. kegs \$5.25 ea.; 10 gal. kegs \$9.00; 25 gal. bbls. \$20.00; 50 gal. bbls. \$35.00.

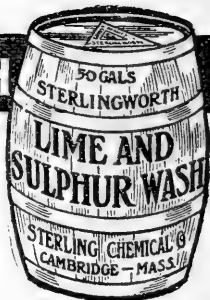
BORDEAUX MIXTURE What It Is and Its Use

(Continued from Page 44)

of **Bordeaux** Compounds do under certain climatic conditions cause rusting. Avoid using **Bordeaux** or Compounds of **Bordeaux** except in settled weather. Sudden change in temperature and damp rainy weather are believed to be favorable to **Bordeaux** injury. We believe that the injury likely to be done by **Bordeaux** to be less than that done by the disease against which it is used. **Bordeaux** should not be used on Japanese plum or similar tender leaved foliage. Its use on Melons and Cucumbers is sometimes followed by injury, but as such crops are generally completely ruined by disease, unless protected, the beneficial results more than offset the injury done.



STERLINGWORTH LIME and SULPHUR WASH



AN EFFECTIVE REMEDY FOR SAN JOSE SCALE, OYSTER SHELL SCALE, SCURFY SCALE AND MANY FUNGI

Sterlingworth Lime and Sulphur Wash is valuable as a wash or spray for the trunks of orchard and shade trees as it acts as a repellant of many insect pests and helps prevent their climbing to the branches. It may be used as an insecticide against the larvae of the Codling Moth and Bud Moth and many other pests that remain in a dormant state in the winter on the bark.

Sterlingworth Lime and Sulphur Wash will not clog the spraying apparatus and is ready for use by adding cold water. No heating is necessary. Many that have experimented by using dry sulphur compounds prefer the pure concentrated liquid solution, having found it more effective and satisfactory. Your dealer will supply **Sterlingworth Lime and Sulphur** solution. Insist and you will get a satisfactory article of full strength.

PRICES: 1 qt. 30c., mailing wgt. 4 lbs.; 1 gal. 80c., mailing wgt. 13 lbs.; 5 gal. jacket cans \$3.00; 10 gal. jacket cans \$4.50; 25 gal. kegs \$7.50; 50 gal. bbls. \$11.50.

STERLINGWORTH DRY BORDEAUX (Fungicide)

This is a fungicide in powder form for accomplishing the same results as **Liquid Bordeaux** (page 45). It is not for killing insects. For a dry powder **Bordeaux Insect Killer**, see **Dry Bordeaux and Paris Green Compound** (page 47).

It is used either as a dust or it may be mixed with water and used as a spray.

As a dust for fruit trees (except Japanese plum and other trees with tender foliage), etc., it is used by adding fifteen to twenty pounds of lime dust to one pound of **Bordeaux**; for potatoes, two to five pounds of lime to one pound of **Bordeaux** gives best results.

In ordering always specify "**Dry Bordeaux Fungicide**" to distinguish it from **Dry Bordeaux and Paris Green Compound**.

Prices: 1 lb. box 35c., mailing wgt. 2 lbs.; 5 lbs. \$1.65, mailing wgt. 8 lbs.



STERLINGWORTH WHALE OIL SOAP WITH TOBACCO



Kills most lice and sucking insects on trees, shrubs, plants, vines and rose bushes.

Sterlingworth Whale Oil Soap with Tobacco is different from Fish Oil Soap. It has a greater efficiency and is more desirable in other ways. It is a Genuine Whale Oil Soap, made from pure whale oil, the killing values of which are increased by the addition of tobacco and tobacco extractive matter. It possesses all the valuable features of both Whale Oil and Fish Oil Soaps with the additional insecticide values of tobacco and may be used for all insect killing purposes for which either Whale Oil or Fish Oil Soap may be used, with doubly satisfactory results. It is a most effective, reliable and cheap remedy for destroying San Jose Scale, Oyster Shell Scale, Aphis, most Plant Lice, most Spiders and other sucking insects on trees, shrubs, plants, vines, rose bushes, etc.

Read the label on the package carefully to see that you get Genuine Whale Oil Soap and not Fish Soap sold for Whale soap. Tell your dealer you want **Sterlingworth Whale Oil Soap with Tobacco**. It costs no more than inferior soap which contains no tobacco.

PRICES: 1 lb. box 25c., mailing weight 2 lbs.; 5 lb. box \$1.00 ea., mailing weight 6 lbs.; 10 lb. box \$1.90, mailing weight 11 lbs.; 25 lb. box \$4.30, mailing weight 30 lbs.; 50 lb. box \$8.00; 100 lb. box \$14.00.

STERLINGWORTH DRY BORDEAUX AND PARIS GREEN COMPOUND

A Combined Insecticide and Fungicide

This is a dry **Bordeaux powder** the same as **Sterlingworth Dry Bordeaux Fungicide** (page 46), but to it has been added poison to make it deadly to eating insects. Thus combined it kills insects and prevents fungous diseases. It may be used with water as a spray or as a dusting powder. The same as **Dry Bordeaux Fungicide** (page 46).

Full directions on label. When ordering specify "**Dry Bordeaux and Paris Green Compound**" to distinguish from "**Dry Bordeaux Fungicide**."

PRICES: 1 lb. box 40c., mailing wgt. 2 lbs.; 5 lb. box \$1.75, mailing wgt. 8 lbs.

**KILLS TWO
BIRDS WITH
ONE STONE**

STERLINGWORTH
AR-BO



**A COMBINED INSECTICIDE
AND FUNGICIDE**

You kill two birds with one stone and get the stone back when you use Sterlingworth Ar-Bo, for you prevent certain fungous diseases and kill most leaf-eating insects at one spraying, and the quality of the increase yield pays for the cost of the material and time of applying.

Sterlingworth Ar-Bo has the fungicide qualities of **Bordeaux** and the killing values of Paris Green and Arsenate of Lead combined in one mixture. It is useful wherever straight **Bordeaux Mixture** is useful in the way of preventing fungous diseases like Anthracnose, Leaf Spot, Black Rot of the Grape and Apple Downy Mildew, Leaf Curl, Sooty Blotch, Fruit Spot of Apple, Leaf Blight of Pear, Black Knot, Potato Blight, Phytophthora Rot, and in addition it controls most eating insects like Bud Moth, Canker Worms, Codling Moth (which makes your apples wormy), Plum Curculio (which stings your apples, plums, cherries, etc), Asparagus Beetle, Cabbage Worm, many Slugs, Currant Worms, certain insects that attack cranberries, the Striped Cucumber Beetle which attacks your squash as well as cucumber vines, grape and potato vines, Rose Bug and Potato Bug.

For Plum, Cherry and other stone fruits, which have tender foliage, the same care must be taken in its use as in the use of **Bordeaux**. It is not for use on Japanese Plum or Peach.

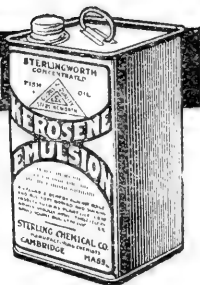
Sterlingworth Ar-Bo is the great potato spray. By its tonic properties on potatoes it helps produce a larger yield of superior quality and it gives the crop in many instances three or more weeks longer in which to mature. Every day's additional growth means larger tubers. Perfect fruit cannot be expected unless you spray with proper materials. Nearly all fruit and vegetables should be sprayed. The additional yield more than pays for the spraying materials and the time required to use.

Sterlingworth Ar-Bo is made ready for use by mixing with cold water. It may be sprayed or sprinkled. "It sticks to the foliage like glue." For general use 1 pound to 5 gallons of water is sufficient. Full directions on label. If your dealer cannot supply **Sterlingworth Ar-Bo** send to us.

PRICES: 1 pound 30c., mailing weight 2 lbs.; 5 lbs. \$1.25, mailing weight 7 lbs.; 10 lbs. \$2.25, mailing weight 13 lbs.; 25 lb. keg \$4.80, mailing weight 33 lbs.; 50 lb. kegs \$9.00 each; 100 lb. kegs \$16.00.



STERLINGWORTH KEROSENE EMULSION



An old reliable remedy for use against Scale and many soft-bodied and sucking insects, such as Plant Lice, Leaf Aphis, Woolly Aphis, Celery Aphis, Squash Bug, Leaf Hopper, Mealy Bug, Cabbage Worm, etc.

Kerosene Emulsion is an article of wide and varied usefulness. It kills the green plant louse scale and many other sucking insects at once.

Many kerosene emulsions are prepared from kerosene, a cheap grade of hard soap and water. Emulsions so made are less efficient than **Sterlingworth Kerosene Emulsion** which is made from Whale Oil Soap and Water-white Oil.

Don't let plant lice and other sucking insects infest your plant and vines when you can buy so cheap a protection as **Sterlingworth Kerosene Emulsion**.

PRICES: 1 pint cans 25c. each, mailing weight 2 lbs.; 1 qt. cans 40c. each, mailing weight 4 lbs.; 1 gallon cans \$1.00 each, mailing weight 11 lbs.; 5 gallon jacket cans \$4.00; 10 gallon jacket cans \$7.50; 50 gallon barrels \$21.00 each.



STERLINGWORTH ARSENATE of LEAD

FOR LEAF-EATING INSECTS



It has great adhesive power and is harmless to foliage. A single treatment of **Sterlingworth Arsenate of Lead** will adhere to the foliage for a period during which two or three sprayings with Paris Green would be necessary. If you desire to prevent fungous trouble as well as kill eating insects use **Ar-Bo**.

(See Page 48)

PRICES: 1 lb. 35c., mailing weight 2 lbs.; 5 lbs. \$1.50, mailing weight 7 lbs.; 10 lbs. \$2.80, mailing weight 12 lbs.; 25 lb. kegs \$6.50; 50 lb. kegs \$12.50 each; 100 lb. keg \$24.00. Larger quantities a matter for correspondence.



STERLINGWORTH SCALE KILLER



FOR DESTROYING SAN JOSE SCALE AND OYSTER SHELL SCALE

San Jose Scale is the most pernicious and serious pest that the owner of a fruit tree has to fight (see page 25). **Sterlingworth San Jose Scale Killer** is a miscible oil. Properly applied it kills San Jose and Oyster Shell Scale and helps protect

trees from reinfestation. The work should be done in the fall, winter or before the buds break in the spring. If only one spraying can be done or it is to be done by inexperienced or careless operators, this is the one fluid to use. Don't think of using any other spray if your trees are badly infested. Where quick action is necessary to save trees, use nothing but **Sterlingworth Scale Killer** and use it no matter what time of year.

One gallon makes 12 to 15 gallons by mixing with cold water. Full directions on every can. We claim that **Sterlingworth Scale Killer** will kill every scale covered by it.

Most dealers will supply **Sterlingworth Scale Killer** on request. If yours will not, send to us.

PRICES: 1 qt. cans 35c., mailing wgt. 4 lbs.; 1 gal. cans \$1.00, mailing wgt. 12 lbs.; 5 gal. jkt. cans \$3.50; 10 gal. jkt. cans \$6.25; 25 gal. bbls. \$12.50; 50 gal. bbls. \$22.

**FOR
USE
AGAINST
TREE
BORERS**

STERLINGWORTH BORER OIL



A few drops of this oil squirted into the tunnels made by Round or Flat Head Tree Borers (see page 18) will usually stop their work. An ordinary oil can is just the thing for applying. When you see the fine sawdust signs of borers at the tree butt, start at once to exterminate the sawdust maker or he will quickly exterminate your trees.

PRICES: 1 pint cans 25c., mailing weight 2 lbs.; 1 quart cans 40c., mailing weight 4 lbs.; 1 gallon cans \$1.50 each, mailing weight 11 lbs.



STERLINGWORTH MAGGOT ACID



Sterlingworth Maggot Acid is for use against that maggot which railroads your carrots, turnips, radishes, and causes your squash vines to die over night. You will find a description of this pest on page 29.

It is for use by mixing with 10 parts of water and pouring around the roots of the plants likely to be attacked. It is non-poisonous. You will not kill birds or toads by using Maggot Acid. Don't wait until your vines or roots are destroyed by maggots, apply early and often as a preventive.

PRICES: 1 pt. cans 25c. each, mailing weight 2 lbs.; 1 gal. cans \$1.50 each, mailing weight 13 lbs.



STERLINGWORTH GYPSY MOTH CREOSOTE



This is a special creosote preparation for painting the egg clusters of the Gypsy Moth (page 14). Do not wait until these egg clusters hatch, and you are obliged to go to the expense of spraying for millions of crawling caterpillars over large areas to protect your property. Every egg cluster painted before hatching time destroys between two hundred and six hundred eggs.

Painting egg clusters is the most scientific, easiest, cheapest, quickest, cleanest and safest way of eliminating this pest.

PRICES: 1 pint 35c.; 1 quart 60c.; 1 gallon \$1.00.

STERLINGWORTH TARRED FELT DISKS

For use around the stalks of Cabbage and Cauliflower plants when first set as a preventive against the root maggot. They are used by fitting closely around the plant and pressing down tightly to ground. Ordinary tarred paper is useless. Our disks are made the right shape from the right material and are free from those imperfections which might permit the fly to find a place for depositing eggs.

PRICES: 100 40c. pp.; 1000 \$2.00 pp.; 5000 \$8.50 pp.



STERLINGWORTH CUT WORM KILLER



STOP FEEDING PLANTS TO CUT WORMS

Sterlingworth Cut Worm Killer is a coarse fibrous preparation for strewing near the plants to be protected. It has an enticing odor and the worms are attracted to it. There is no guess work about it doing the "business." The dead cut worms which are found after its use "tell" the story.

Order **Sterlingworth Cut Worm Killer** when you buy your seeds. The cut worms will not wait for you to buy it so have it on hand ready for use at the right time. The cut worm does most damage at night and in one or two nights may destroy your entire crop. One pound is sufficient for 175 plants when in hills and 100 lineal feet when in rows. Most dealers will get it for you. If yours will not, send to us. Satisfaction Guaranteed or Money Refunded.

PRICES: 1 lb. box, 25c., mailing weight 2 lbs.; 5 lb. box, \$1.00, mailing weight 6 lbs.; 25 lb. pkg., \$4.00 each, mailing weight 33 lbs.; 100 lb. bags, \$12.00 each.

Burns
Three
Hours

STERLINGWORTH THREE HOUR SULPHUR CANDLES

KILLS MANY INSECT PESTS AND CERTAIN DISEASE GERMS

Sterlingworth Sulphur Three-Hour Fumigating Candles produce a large quantity of vapor. The wick is easy to light and when "lit" stays "lit."

They contain sufficient sulphur to burn three hours. They are excellent for ridding poultry houses, dog kennels, cellars, outhouses, etc., of most insect pests and disease germs. The vapor from them penetrates crevices which cannot be reached by powders or liquids. Sulphur fumes are recommended by many Boards of Health and physicians for destroying Typhoid, Diphtheria, Small-pox and many other disease germs.

PRICE: 15 cents each, mailing weight 1 pound.

For Parcel Post mailing rates see Back Cover.





STERLINGWORTH RED SPIDER EMULSION

A LINSEED OIL EMULSION



The Greenhouse "Red Spider" has long been one of the most serious pests with which growers of greenhouse plants have had to contend. Cucumber plants are often seriously injured, and various ornamental plants are no less immune.

Control. Recent experiments conducted at the Massachusetts Experiment Station have demonstrated conclusively that "Red Spider" can be controlled and injury prevented by a thorough application of Linseed Oil Emulsion. **Sterlingworth Red Spider Emulsion** is prepared according to the approved formula and will be found a cheaper and more efficient remedy than the home made emulsion.

Directions. Apply as a spray to the under side of the leaves, so that an even film is formed. Spray thoroughly. Repeat in seven days' time to kill individuals that were in the egg stage at the first application. **PRICES:** 1 quart 50c.; 1 gal \$1.50.



STERLINGWORTH POWDERED TOBACCO

Finely
Powdered
Strong
in
Nicotine

An effective and cheap remedy for many bugs, worms, lice and spiders on Cabbage, Squashes, Melons, Cucumbers, Potatoes, Plants, etc. It is for use while the vegetation is damp. This Tobacco is very finely powdered, sticks well to the leaves and is strong in Nicotine. The **Sterlingworth Powder Gun** shown on page 70 is an excellent article for use in applying small quantities to house plants.

PRICES: 1 lb. sifter top box 20c., mailing weight 2 lbs.; 100 lb. sacks \$6.00 each. (Add 5 cents for packing when ordered by parcel post.)

COPPER SULPHATE

Price fluctuates. Send for price. State quantity you wish to purchase.



STERLINGWORTH HE-BO

A
Substitute
for
Hellebore

We know of no powder more satisfactory for use against Rose slugs, currant worms, cabbage worms, and many other leaf eating insects where a milder poison than Paris Green is desired than **Sterlingworth He-Bo**.

It is not intended as a spray but is for dusting on the vegetation to be protected. For many uses it is superior to the Hellebore generally sold for killing insects. Put up in sprinkler-top boxes

ready for using.

PRICES: 1-2 lb. box 15c., mailing weight 1 lb.; 1 lb. box 25c., mailing weight 2 lbs. Add 5c. for packing to above prices if ordered by mail. 10 lb. box \$2.00 each; 50 lb. box \$8.00 each; 100 lb. kegs \$15.00 each.



STERLINGWORTH POWDERED HELLEBORE

FOR USE AGAINST CERTAIN LEAF-EATING INSECTS WHERE A VIOLENT POISON IS OBJECTIONABLE

Sterlingworth Hellebore may be used dry or as a spray. Full directions on each package. Tell your dealer you want **Sterlingworth Hellebore**, the fine powdered kind that is ground from pure, fresh, prime root and put up in the round tight sifter-top box.

Price variable owing to European conditions. **Quotations** upon application.

See description of **Sterlingworth He-Bo** above for satisfactory substitute.



SULPHUR FLOUR

Useful for spraying mixtures, fumigating, Lice on Plants, Lice on Poultry, Horses and Cattle.

PRICES: 1 lb. boxes 20c. each, mailing weight 2 lbs.; (add 5c. for packing when mailed); 100 lb. bags, 8 cents per pound.

Protects
Stock
From
Flies

GUARANTEED CATTLE OIL

PROTECTS STOCK FROM FLIES



Buy a can of **Guaranteed Cattle Oil**. Use it as directed and if it does not protect your cattle and horses from flies and mosquitoes to your satisfaction, you to be the judge of what constitutes satisfaction, return the empty can to the dealer from whom you made the purchase and he will return to you the purchase price. We leave the matter of what constitutes satisfaction entirely to your honor. All we ask is that you use it as directed, give it a good, honest, fair trial.

Guaranteed Cattle Oil is as good an article as we can make regardless of price consideration. Thousands of cans have been sold under the above "Money Back" guarantee and during the five years it has been on the market less than 10 cans have been returned. We claim that when properly used it will protect cattle all day in ordinary weather. It does not taint the milk and is not disagreeable to use.

It is to some extent useful against lice on cattle and horses but we do not recommend it for lice, as any preparation strong enough to be a good lice killer will blister the animal if it is used for a fly spray. **Guaranteed Cattle Oil** may be used with a brush or sprayer. The **Deluge Sprayer** described on page 60 is one of the best for applying.

Guaranteed Cattle Oil does not depend for its effectiveness on killing flies but on the fumes and odor which arise from it. Flies hit by the fluid are killed, the others are kept off by the odor.

Read what we say about flies on page 19. These filthy insects spread disease and by continually annoying stock cause it to lose flesh and injure its health. Use **Guaranteed Cattle Oil** and your cows will be insured perfect rest; will feed in peace and quiet and will give you a maximum quantity of milk on a minimum quantity of food. It pays a big profit to protect milk cows from flies.

Order **Guaranteed Cattle Oil** from your dealer. If he does not have it and will not furnish it, or offers something else, send us his name and address and we will send you a gallon can for one dollar, charges paid. This offer is only good to points east of the Mississippi.

PRICES: 1 qt. cans 30c. each, mailing weight 4 lbs.; 1 gal. cans \$1.00 each, mailing weight 11 lbs.; 5 gal. jacket cans \$3.50 each.



STERLINGWORTH PLANT LICE KILLER



For use against Aphis on fruit trees, potatoes, vegetables, garden truck, and house plants. It is a combination of tobacco extractive matter, nicotine, Whale Oil Soap, water and oil. The soap content makes it stick, also kills many insects hit by it. The oil increases its spreading qualities, and the nicotine and tobacco kills those insects hit by it.

Nicotine preparations kill by contact. You must hit the insect to kill it. The oil in the **Sterlingworth Plant Lice Killer** spreads the fluid over a large area and reaches insects that would not be hit by watery mixtures.

Those wishing to use Sulphate of Nicotine against lice will avoid the trouble of making up soap fluids, which must **always be used with nicotine solutions** to secure satisfactory results, by using **Sterlingworth Plant Lice Killer** which has the soap and oil mixed ready for use by adding 15 parts of water.

It may be applied with any sprayer. The Deluge Spray pump, described on page 60, or the Mouth Sprayer, described on page 62, will be found suitable for applying.

PRICES: Pints 25c., mailing wgh. 2 lbs.; quarts 40c., mailing wgt. 11 lbs.



STERLINGWORTH SHEEP DIP

**FOR
TICKS
LICE
AND
SCAB**

This is a coal tar creosote dip. It is a concentrated fluid for preparing an effective and economical dip for ridding sheep of ticks, lice and scab, also kills certain fleas, and gnats on horses, cattle and hogs.

One gallon makes 56 gallons of strong dip by mixing with water.

PRICES: 1 qt. can 50c., mailing weight 4 lbs.; 1-2 gal. can 85c., mailing weight 7 lbs.; 1 gallon can \$1.50, mailing weight 11 lbs.; 5 gallon jacket cans \$6.00 each.

**FOR
ANTS
IN
LAWNS**

STERLINGWORTH ANT-I-CIDE



We tell the story about ants on page 33. They are a persistent pest. It is impossible to harbor them and have a good lawn. Either give up the lawn or the ants. If you prefer the lawn, try **Sterlingworth Ant-i-cide**. It is a powder to be sprinkled on the ground. One pound covers about 200 square feet. Induce your neighbors to use **Sterlingworth Ant-i-cide** and thus help protect your premises from invasion. **Guaranteed to give satisfaction or money refunded.** Most Seedsmen sell it.

PRICES: 1 lb. box 25c., mailing weight 2 lbs.; 5 lb. bxs. \$1.00, mailing weight 6 lbs.; 25 lb. drums, \$4.50 each, mailing weight 33 lbs.



STERLINGWORTH ANTI CROW CORN OIL

**Keeps
Crows
From
Pulling
Corn**

PROTECTS NEWLY PLANTED CORN FROM CROWS

Don't kill the crows and blackbirds. Keep them from damaging your crops by preventive measures. Crows and blackbirds help keep down the bugs. Read what we say about birds on pages 1 and 2. You need the crows' help.

Dip a stick into a can of **Sterlingworth Anti Crow Corn Oil** and stir it around in a peck of corn until the corn is darkened a little. Then expose it to sun and dry, so it will run through a seeder, or you can mix a gallon of **Sterlingworth Anti Crow Corn Oil** with two gallons of hot water and add the corn while stirring. The oil will give it a thin crow-protecting coat, which is an easier and cheaper way of protecting your newly planted corn from crows and blackbirds than by "scarecrows." Do not confuse crow oil with so-called "Crow Tar" or corn tar. It is different in odor, and stronger. One trial will convince you. Tell your dealer to get **Sterlingworth Anti Crow Corn Oil**—not **Corn Tar** or **Tar Oil**. You save expense by buying of him. If he will not supply it, send to us.

PRICES: 1 pint 25c., mailing weight 3 lbs.; 1 quart cans 40c., mailing weight 4 lbs.; 1 gallon cans \$1.25, mailing weight 13 lbs.



STERLINGWORTH WEED KILLER

**KILL
WEEDS
IN
WALKS**

**FOR KILLING WEEDS IN WALKS,
DRIVES AND TENNIS COURTS
WHERE NO VEGETATION
IS WANTED**

Sterlingworth Weed Killer is especially adapted for destroying weeds in walks, drives, dirt tennis courts, golf links, etc., or any other place where the killing of all vegetation is desired. It is successful against all kinds of weeds and grass, including **milkweed, witchgrass, wild morning glory, dandelions, poison ivy, sumach, etc.** One application will kill roots and foliage in 48 hours and no more weeds will grow until more seed is sown.

Its use does away with hoeing up your walks and drives, tennis courts and grounds, to kill the weeds. By its use the surface is left undisturbed, which helps to prevent it being washed by rains. One man can cover more surface with **Sterlingworth Weed Killer** in a few minutes than can three men working all day with hand hoes or weeders. It offers the cheapest, quickest and best method of killing weeds.

Ground treated with **Sterlingworth Weed Killer** may be planted again any time after a heavy rain. For something quick and sure for killing poison ivy in walls or places where roots are not accessible, try **Sterlingworth Weed Killer**. Don't let weeds grow between the bricks or in the cracks of your walk.

It is a powder for use by dissolving in water and is applied with an ordinary watering pot. One pound makes ten gallons. Each can contains directions for use. Ask your dealer to get it for you. All Seedsman sell it. If he will not supply you, send to us.

PRICES: 1 lb. package 50c., mailing weight 2 lbs.; 5 lb. package \$2.00, mailing weight 6 lbs. Price on bulk lots matter for correspondence.

Sterling Chemical Co., Cambridge, Mass.

July 18, 1912.

Gentlemen: I have used with good success the **Sterlingworth Lawn Compound** for removing weeds from Putting greens at the Brunswick Golf Club. I do not hesitate to recommend same.

Very truly yours,
BENJAMIN L. FURBUSH,
Care Brunswick Golf Club,
Brunswick, Maine.

**KILLS
WEEDS
IN
LAWNS**

STERLINGWORTH LAWN COMPOUND

**KILLS WEEDS IN LAWNS WITHOUT
KILLING GRASS, MAKES THE
LAWNS GREEN AND VELVETY.**

We have manufactured **Sterlingworth Lawn Compound** 6 years. It gives universal satisfaction. We guarantee that it will kill weeds such as plantain, dandelions, chick-weed and most other weeds having a broad hairy surface without killing the grass. Money back if it fails.

Sterlingworth Lawn Compound is a non-poisonous dry powder for sowing on the lawn and adheres to the broad flat leaves of such weeds as those named above. It does not stick to the grass because of its upright position and smooth surface. The ingredients in combination with the sun's rays burn out the weeds. The compound has an invigorating effect on the grass, which stimulated by it springs up rapidly and gets ahead of the weeds that have been stunted and killed by the compound and quickly chokes them out. The use of **Sterlingworth Lawn Compound** helps give to the grass a beautiful rich bottle-green velvety color so much admired by lovers of good lawns. Two applications will clean out the most heavily weeded lawn. In many instances one application will do it. Do not dig out weeds, it leaves bare spots and holes. **Sterlingworth Lawn Compound** is easily applied by sprinkling over the weedy lawn. One pound will dress 100 to 200 square feet, depending on the lawns condition.

Sterlingworth Lawn Compound is only for destroying weeds where there is grass. Most Seedsmen and hardware dealers sell it. If he refuses to supply you send to us.

PRICES: 5 lb. cans 60c., mailing weight 6 lbs.; 10 lb. cans \$1.00, mailing weight 11 lbs.; 50 lb. kegs \$4.00; 100 lb. kegs \$7.50. Special prices quoted on larger lots.



Bangor, Me., Sept. 20, 1912.
Sterling Chemical Company, Cambridge, Mass.

Gentlemen: Please send me 2—5 lb. cans of **Sterlingworth Weed Killer** by American Express. This is the best thing I have ever used.

Yours,
S. R. PRENTISS.



STERLINGWORTH WATER GLASS

**KEEPS
EGGS
TEN
MONTHS**

**Saves Money and Helps Keep Down the
High Cost of Living**

Put down eggs in the spring and summer when they are cheap and keep them fresh for ten months. One gallon makes sufficient for 50 dozen. Do not trust eggs to water glass of inferior strength. Water glass must be pure and strong to safely protect eggs.

Sterlingworth Water Glass is first quality and will stand the maximum amount of dilution with water. Don't take chances. There is a great difference in the quality of water glass. Tell your dealer to get **Sterlingworth Water Glass** for you. The brand that has been right since 1905. We sold sufficient in 1917 to preserve 4 million eggs without a complaint.

PRICES: 1 quart 30c., mailing weight 5 lbs.; 1 gallon 75c., mailing weight 15 lbs.; 5 gal. cans, \$3.00 each; 10 gal cans, \$5.20 each.

DELUGE SPRAY PUMPS

These sprayers are well made from good quality tin, and with reasonable use will give several years' service. The construction is such that it can be laid down to be filled, and after being filled will not tip over. There is not a better sprayer for the price than the **DELUGE**. They are made from heavy tin, with double locked (not laped) seams.

It is just the thing for applying Liquid Lice and Mite Killer, Disinfectant Fluids, Fly Killers, Fish Oil Soap, Kerosene Emulsion, Lime and Sulphur Wash, Bordeaux and Paris Green Mixtures, Liquid Bed Bug Killers, Plant Lice Killer and for spraying vegetables and fruit. Excellent for use in sprinkling clothes, dampening floors before sweeping, etc.

Deluge No. 1 is 24 inches long. The air cylinder is 19 inches long and 1 3-4 inches in diameter. Capacity 1 quart, **PRICE 75c. each.**

Deluge No. 2 is 12 inches long. The air cylinder is 10 inches long and 1 1-4 inches in diameter. **PRICE 40c.**

For
Treating
Potato
and
Grain
Seed

STERLINGWORTH No = SCAB



Grain Smut prevails wherever oats and other grains are grown. Potato Scab is also more prevalent each year. Never plant potatoes without treating the seed with No-Scab.

For Oat, Wheat and Rye Smut (except loose smut of wheat and barley which this preparation will not control) spread the seed on the floor, sprinkle with **Sterlingworth No-Scab**, 1 pound (1 pint) to 36 gallons of water, and shovel over to mix thoroughly, after which spread out and dry.

For Stinking Smut of Wheat and Grain, pour seed into the solution, stir and skim off smut balls as they rise to surface.

For Potato Scab, and to destroy other germs on seed potatoes, soak two hours in **Sterlingworth No-Scab**, 1 pound to 15 gallons of water. **PRICE: 1-2 lb. bottles, 40c. each.**



CREOLUSOL

LIQUID DISINFECTANT AND DODORIZER

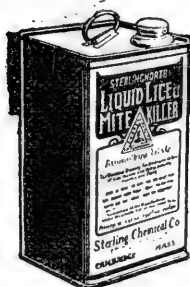


Creolusol is a powerful antiseptic and purifier. It helps to heal wounds, destroys bad odors and disease germs. It will keep your house clean and healthful and prevent contagion. It is useful wherever a foul odor or disease germ is to be destroyed. It is used by mixing with water as wanted.

Valuable for washing out Incubator Cellars, Incubators, Brooders, Brood Coops and Drinking Utensils.

For General Use. One quart of **Creolusol** makes fifty quarts of Disinfectant. No household, farm, stable or factory should be without it. Full directions on each package.

PRICES: 1 pt. cans 25c., mailing weight 3 lbs.; 1 qt cans 50c., mailing weight 4 lbs.; 1 gal. cans \$1.50, mailing weight 11 lbs.; 5 gal. cans \$5.00; 10 gal. cans \$9.00.



STERLINGWORTH LIQUID LICE & MITE KILLER

**Kills
the
Chicken
Mite**

**FOR DESTROYING CERTAIN LICE, IN-
SECTS AND MITES ON FOWLS AND
STOCK**

If, after using Sterlingworth Liquid Lice and Mite Killer, you do not believe it is better than any other preparation you ever used for killing lice and mites in poultry houses, state the facts to us and we will refund the purchase price without quibble or question.

It requires an entirely different method to rid poultry houses of mites than to kill lice on fowls. No powder is entirely satisfactory for this purpose, for these blood-sucking pests inhabit cracks and crevices in the building where it is impossible to reach with a fluid or powder, and it is necessary to depend upon a gaseous vapor to penetrate their hiding places. Read about lice and mites on page 35.

Sterlingworth Liquid Lice and Mite Killer has a double value. It kills by contact, and the vapor thrown off by its wonderful evaporating qualities helps kill certain vermin. Poultrymen who do not find mites on their fowls should not be led to the delusion that their houses are free from them, for they attack fowls when they are on the roost at night, suck their blood during the sleeping hours and hide in their retreats under the roosts or in crevices during the day.

To treat a large number of fowls, apply liberally to nests, roosts, supports and dropping boards.

For young chickens. Paint the bottom of a box with the liquid and cover with a thin layer of straw. Place the young chickens on the straw and cover the box with bagging.

To kill lice on hogs. Spray bedding and rubbing posts thoroughly.

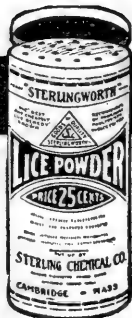
PRICES: 1 qt. cans 35c., mailing weight 4 lbs.; 2 qt. cans 60c., mailing weight 7 lbs.; 1 gallon cans \$1.00, mailing weight 11 lbs.; 5 gallon jacket cans \$3.50.

STERLINGWORTH MOUTH SPRAYER

It is used by placing the long end in the fluid to be sprayed blowing through the short flat end. With it the under side of the leaves may be sprayed where plant lice, aphids, spiders and other crawlers which infest house plants usually work. Just the thing for applying **Sterlingworth Plant Lice Killer** (described on page 56), or any other fluid. **PRICE: 10 cents; pp, 15 cents.**



STERLINGWORTH LICE POWDER



Spread a newspaper on the floor or ground. Hold the fowl over it while dusting. Five minutes after you have completed the application brush out the fowl's feathers and if there are not as many dead lice on the paper as there were live ones on the fowl, state the facts to us at once, and we will return you the purchase price. If it is not better (**NOT AS GOOD BUT BETTER**) than any Lice Powder you have ever used, we will cheerfully return the money.

There is one best lice powder. We claim to have it. Try one package and get your money back if it is not better than what you have used.

At present high prices of feed and labor you cannot afford to feed lice. Lice "cut" your egg production and affect the fowl's general health. Keep down the lice or the lice will "keep you down." Never set a hen without putting **Sterlingworth Lice Powder** in her nest.

Sterlingworth Lice Powder is good for most vermin on horses, cattle, calves and hogs. If your horses, cattle or young stock are lousy sprinkle a little on a brush and brush well the coat. Ask your dealer to get you **Sterlingworth Lice Powder**, the strong, better-than-you-ever-used-before-or-money-back-kind that comes in a sifter-top box. If he refuses or tries to substitute, send to us. Agents wanted where we have no dealer.

Hold your fowl over a paper when dusting with **Sterlingworth Lice Powder**, count the number of lice you find on the paper, report the number to us and we will mail you free of charge a 25-cent package of **Sterlingworth Egg Tablets**, described on page 66. This holds good no matter whether you buy of a dealer or of us, but the report must be mailed direct to us at Cambridge, Mass.

PRICES: 5 oz. box 10c.; 15 oz. sprinkler box 25c., mailing weight 2 lbs.; 48 oz. package 50c., mailing weight 5 lbs.; 100 oz. package \$1.00, mailing weight 7 lbs. Prices in Bulk for use on Cattle, Horses, Hogs, etc., 25 lb. pkg. 14c. 1b.; 50 lb. pkg. 13c. 1b.; 100 lb. pkg. 12c. 1b.

Mt. Pleasant Stock Farm,
Keene, N. H., Jan. 21, 1917.

The Cattle Lice Powder you sent us some time ago did the trick every time.

D. R. & F. A. COLE,
Owners.



STERLINGWORTH DIARRHOEA REMEDY

For
White
Diarrhoea

A GUARANTEED REMEDY FOR WHITE DIARRHOEA IN YOUNG CHICKS AND FOR DYSENTERY, DIARRHOEA AND ALL BOWEL TROUBLES IN FULL GROWN FOWLS.

It Sterlingworth Diarrhoea Remedy is not satisfactory, you to be the judge of what constitutes satisfaction, return the empty box, any time within two months from date of purchase, state from whom purchased to Sterlingworth Chemical Co., Cambridge, Mass., and we will refund the purchase price. Can anything be fairer or can we do more to convince you of the reliability of this remedy? We know of nothing like it. It is the old original White Diarrhoea Powder. An "every time" preventive for bowel troubles, diarrhoea, dysentery, etc., in young chicks and old fowls and for White Diarrhoea in young chicks. Don't wait until your little chicks have diarrhoea. Keep the remedy on hand and use some in the "little fellows" drink when they are two days old. "An ounce of prevention is worth a pound of cure." Have it on the shelf ready and you won't lose chickens. Order a package when you set your eggs. One chicken saved pays for a box. It is used in the drink of the fowls and chicks. They take their own remedy. If your dealer will not supply it, get our special agent's dozen price and make money selling it to your neighbors. **Don't let a chick die with bowel trouble in your neighborhood.** Full directions with each package.

PRICES: 25 cents and 50 cents postpaid.

STERLINGWORTH SALT CAT

Sterlingworth Salt Cat is a scientific combination of those aromatic and tonic properties that are recognized by pigeon keepers as aiding digestion, promoting good health and egg production in pigeons and game fowls.

These ingredients are cast in a brick form, soft enough to be easily pecked apart. Every pigeon fancier should feed **Sterlingworth Salt Cat.**

PRICE: Per brick, 15 cents, mailing weight 2 lbs.

See Back Cover for Parcel Post Mailing Rates.

NO
CURE
NO
PAY

STERLINGWORTH ROUP REMEDY

A GUARANTEED MONEY-BACK REMEDY FOR ROUP



Buy a box of Sterlingworth Roup Remedy anywhere from anyone. Use three-fourths of the contents according to directions. If it is not satisfactory, you to be the sole judge of what constitutes satisfaction, return to us the box containing the fourth unused. State from whom purchased, the date of purchase and in what way it proves unsatisfactory, and we will return to you the purchase price. We rely entirely upon your honor to treat us as you would wish to be treated if our positions were reversed. Your report and box must be mailed directly to us at Cambridge, Mass. **Dealers do not honor this offer.** We honestly believe that this is the best roup "cure made" and make this extraordinary offer to convince you of its absolute reliability.

Roup is one of the most common, most contagious and most fatal diseases which afflict poultry. It frequently starts with a simple cold and if unchecked quickly spreads through the entire flock. The symptoms are odorous discharges at the mouth and nostrils followed by swelling of the head and quick breathing. The fowl has an offensive breath and canker spots sometimes appear. For years this terrible disease raged unchecked and killed millions of fowls. It can now be prevented and relieved with this remedy which is administered in the sick fowl's drink and in this way they take it. If the disease is so far advanced that the fowls cannot see to drink, their heads may be bathed in the medicine until they have sufficiently recovered to drink. Use a little of this remedy in the fowls' drink as a preventive of roup, canker and common colds, and you will save much trouble. It is an excellent remedy for canker. Ask your dealer to get **Sterlingworth Roup Remedy, "the-money-back-the-no-cure-no-pay-kind."** If he will not supply you or offers something else, write to us for special prices to agents and make money selling it. Protect your own flocks from contagion by inducing neighbors, whose flocks are afflicted with colds or roup to use this remedy.

PRICES: Box to make 25 gallons, 25 cents, postpaid; box to make 75 gallons, 50 cents, postpaid.



STERLINGWORTH EGG TABLETS

More
Eggs
or your
Money
Back

Try one box of Sterlingworth Egg Tablets with the distinct understanding that if after using one-half the contents you are not pleased with their results you may return to us the unused half, and we will refund you the purchase price.

This offer applies to any package of Sterlingworth Egg Tablets no matter from whom the purchase is made, returned to our office,

Cambridge Mass.

The fellow who claims that egg tonics are useless and should not be fed to hens is the fellow you meet most frequently in the drug store buying spring tonics, cascara, quinine or liver pills. Careful inquiry will generally show that he believes in "dosing" himself, wife, horse, dog, cow and cat, but on the point of "heping out" the hen he takes a different stand. You will generally find that he bases his judgment upon the use of the old style filler egg foods which contained so much useless filler that a hen had to eat a bushel or so of filler to get one dose of medicine. By "filler" we mean bran, screenings, and other low-priced materials used to make the package look "a lot for your money."

Sterlingworth Egg Tablets contain no "filler" and if a tonic is good for man and domestic animals, why not the hen.

These tablets are as large as a five-cent piece and over an eighth of an inch thick and contain more egg-stimulating tonic value than is contained in a pint of many filler egg foods. They are used by dissolving in water or may be crushed into powder and given either in the fowl's drink or by moistening food with the water in which the tablets are dissolved or mixed dry with mash foods. The best way is to **feed** in the food. Full directions on every package. Agents wanted in every town. Send for agents' prices on dozen lots.

PRICES: Trial size (25 tablets) 25c. pp., large size (75 tablets), 50c. pp.; 500 tablets, \$2.75 pp.; 1000 tablets \$5.00 pp.

STERLINGWORTH GOINGLIGHT TABLETS

These tablets when used according to directions, will help overcome the peculiar and much dreaded disease known to pigeon and poultry keepers as "Goinglight." In case they fail we guarantee to refund the purchase price.

Scores of pigeon keepers have used them with most gratifying results. Fanciers find them of great value in bringing exhibition birds to weight. **PRICE: 25 cents, postpaid.**



STERLINGWORTH ANT DRIVER



FOR DRIVING ANTS FROM HOUSES

Ants are of a very high order of intelligence. Read the story about them on page 33. None of the powders useful against other small insects seem to be effective against them. Their persistence is marvelous and a strong driver is necessary to banish them. If you have had to stand your molasses jug in water to keep the ants from pulling out the cork **Sterlingworth Ant Driver** will please you. It is a non-poisonous powder for sprinkling. Every package is guaranteed to give you satisfaction or we will refund the purchase price.

PRICES: In patent sprinkler boxes, 25c. postpaid; 1 lb. can 50c., mailing wgt. 2 lbs.; 5 lb. box \$1.75, mailing wgt. 6 lbs.; 10 lb. box \$3.25, mailing wgt. 12 lbs.



STERLINGWORTH RAT KILLER



Sterlingworth Rat and Mice Killer has a charm for rats the same as catnip has for cats. It has a corrosive effect on the linings of the stomach and creates a thirst which drives the victim to its usual drinking place, near which they generally die. This with the properties that dry up or internally embalm the carcass makes it useable in the house without disagreeable consequences.

Sterlingworth Rat and Mice Killer is in paste form and is used by spreading on fish, meat, doughnuts, cheese, buttered bread or any other favored food. Read what we say about rats on page 34. Don't let them gain a foothold. Fight them on sight of first signs. It is easier to kill and drive them when they first come than after they have reared young on your premises. Get after them with **Sterlingworth Rat and Mice Killer** when they first appear.

PRICES: Factory and Hotel size, \$1.00 postpaid; Household size, 25c. postpaid.



STERLINGWORTH BED BUG SPRAY



Many people prefer a fluid for fighting Bed Bugs (page 32). It is generally considered more effective than a powder for it can be forced into cracks and crevices not easily reached by a powder. **Sterlingworth Bed Bug Spray** is safer to use than benzine or gasoline mixture as it is non-explosive. It does not stain clothing when applied in a fine mist with a spray pump, (See Deluge page 60). Bed Bugs that are hit by the spray or that crawl through the spray are killed. Insist upon getting **Sterlingworth Bed Bug Spray** from your dealer and you will be satisfied with the results. In ordering specify "Spray" to distinguish from "Powder" described below.

PRICES: 1 qt. cans 50c. each, mailing weight 4 lbs.; 1 gal. cans \$1.50 each, mailing weight 12 lbs.; 5 gal. cans \$6.50.



STERLINGWORTH BED BUG POWDER



**NON-POISONOUS TO MAN BUT
DEATH TO BED BUGS**

It does not stain clothing, injure bedding, is non-poisonous to human beings, clean, safe and easy to use. It is not necessary that it come in contact with the pests to kill them. Safer to use than benzine, turpentine, because not inflammable. Dead sure every time. Every ounce sold under our **guaranteed satisfaction or money refunded.**

We tell about bed bugs on page 32. If you have been looking for a good powder to fight these pests **Sterlingworth Bed Bug Powder** is what you have been looking for.

If you buy the larger sizes, the goods cost little per pound. The **Sterlingworth Powder Gun** (see page 70) is just the thing for applying. In ordering specify "powder" to distinguish from "spray" described above.

PRICES: 1-4 lb. sprinkler top box 25 cents, postpaid 30c. 1 lb. \$1.00, mailing weight 2 lbs.; 5 lbs. \$4.50, mailing weight 6 lbs.; 10 lbs. \$8.50, mailing weight 12 lbs.; 25 lbs. \$20.00.



STERLINGWORTH FLEA KILLER



If an elephant could jump as far in proportion to his size as a flea, he could jump around the world in five jumps.

When Billie Jones tied a can on your pet dog's tail you had him arrested and asked the judge to punish him to the full extent of the law, yet the suffering from "can-on-the-tail" is not to be compared with the agony from "flea-in-the-hair." When Rover or Tabby gives you the "scratching sign," remember how miserable a few mosquitoes make you and get busy" with flea relief measures. Don't keep a pet unless you are willing to do the "right thing" by it, and leaving your cat or dog to fight fleas when you can relieve him by using **Sterlingworth Flea Killer** is NOT doing the "right thing."

Sterlingworth Flea Killer does away with washing dogs and cats for fleas. Stand the animal on a sheet of paper and work **Sterlingworth Flea Killer** to the skin on the head, then into the hair on the rest of the body, and you will see the fleas drop dead from the animal.

PRICE: 2 oz. sprinkler box, 25 cents postpaid.



STERLINGWORTH ROACH KILLER



Roaches and Water Bugs multiply rapidly and should be destroyed as soon as noticed.

Sterlingworth Roach Killer is non-poisonous to human beings, but fatal to these crawling household pests. It is a powder for sprinkling around sinks, mopboards, sills, pipes, and other breeding places. Twenty-four hours after use the dead insects will be found on the floor where they can be swept up.

Ask your neighbors to use **Sterlingworth Roach Killer**. This helps to protect your home from invasion.

PRICES: 1-4 lb. box 25 cents, postpaid 30 cents; 1 lb. box 80 cents, mailing wgt. 2 lbs.; 5 lb. box \$3.50, mailing wgt. 6 lbs.; 10 lb. box \$6.50, mailing wgt. 12 lbs.; 25 lb. kegs \$15.00, mailing wgt. 33 lbs.; 100 lb. kegs, \$55.00.



STERLINGWORTH SONG RESTORER

"The
Canary
Come
Back"

No lover of the Canary should be without this health and song stimulator. It is a wonderfully invigorating tonic for Canary Birds, Gold Finches, Parrots and most seed-eating birds. It is for use in small quantities in connection with the daily food, and supplies elements necessary to healthy bird life. It helps restore to their natural notes, birds which have lost their song from exposure to cold or from excessive moulting. Excellent for breeding birds. Your pet must "feel right" to sing, and **Sterlingworth Song Restorer** helps him to "feel right." If your bird is not doing well or does not sing, the use of just one box will show pleasing results. More healthy, lively birds, more song and better plumage follow its use. Special price to agents on dozen lots. **PRICE: 25 cents postpaid.**



STERLINGWORTH INSECT POWDER

Genuine
Dalmation
Powder

This is the genuine, old fashioned, fine powdered dalmation powder, made from selected closed dalmation flowers, the pure strong kind that kills. Very useful against lice, flies, fleas, roaches and many other pests. Put up in sprinkler top boxes. **PRICES: 1 oz. box 15c. p. p.; 2**

oz. box 25c. p. p.

STERLINGWORTH POWDER GUNS

Especially useful for blowing Insect Powder, Bird Lice Powder, Hellebore, Powdered Tobacco, etc. Any powder that can be blown can be used in this gun. It is easily filled. Nothing better of its kind made. **PRICE: 10c. p. p. 15c.**

STERLINGWORTH CAGE BIRD LICE SALVE

Lice require a certain amount of moisture and those parts of the bird where it may be procured must be visited by lice. This preparation is for anointing those parts, and when the lice come in contact with the ointment in search of moisture, they are destroyed. It is the most satisfactory and easily used remedy known for lice on canary birds.

PRICE: In tin box, 15c. postpaid.

Makes
Plants
Bloom

STERLINGWORTH PLANT TABLETS



A POWERFUL ODORLESS PLANT INVIGORATOR

Nothing adds more to the appearance of the home than a window garden of healthy, blooming plants. Nothing cheers the sick more than flowers, and few things give so much pleasure to the housewife as her potted plants.

Sterlingworth Plant Tablets were originated and first used by a chemist who loved flowers and made their care and attention a "hobby." His plant-loving friends had such wonderful success with the tablets he gave them that he was induced to offer them for sale, and from this love of the beautiful and spirit of kindness, the present world-wide business in **Sterlingworth Plant Tablets** has grown.

They contain those ingredients in their proper proportions that are necessary for healthy plant life. Their use promotes a luxuriant, vigorous growth of branch, leaf, and flower. Users have told us that they "double the bloom."

Renewing of plant soil is made less important and is less frequently needed, when these tablets are used. They build up the soil, and supply scientifically the elements necessary to a wholesome growth.

Sterlingworth Plant Tablets are more effective than what is commonly known as "liquid manure," which contains much waste matter which pollutes the soil and is generally accompanied by a disagreeable odor.

Thousands of plant lovers who do not keep plants would do so they knew how beautiful and luxuriantly they could make them bloom by feeding with **Sterlingworth Plant Tablets**. To those who have plants that are not as beautiful as they should be we say, "try these tablets just once, the cost is trifling, the results wonderfully satisfactory." When you learn how satisfactory they are, you will buy more. They are used by dissolving in water and watering the soil with the solution. Tell your plant-loving friends about them. They are sold by thousands of florists, druggists, seedsmen and agents throughout the United States and Canada. Agents who can devote a little time to selling these tablets will find the profits satisfactory. Write for prices on dozen lots.

PRICES: Large size (250 tablets sufficient for 35 plants for eight months) 50 cents, postpaid; medium size (100 tablets sufficient for 35 plants for three months) 25 cents postpaid; trial size (30 tablets) 10 cents, postpaid.



STERLINGWORTH BIRD TONIC

**Helps
Keep
Birds
in
Health**

A Reliable Medicine for Loss of Song, Asthma or Hard Breathing, Diarrhoea, Moulting Out of Season, and Those Troubles Arising from Colds or Exposure of Cage Birds. It is a liquid and is administered in the drinking water. Sick birds will not sing. If your bird has lost its song try this tonic. Full directions on bottle.

PRICE: Postpaid, 25 cents.

STERLINGWORTH WAFER FISH FOOD

For Aquarium Fishes

An imported cereal wafer food for feeding Gold Fish. Each wafer is 2 3-4 by 3 3-4 inches and about the thickness of blotting paper. The fish relish it greatly and thrive upon it wonderfully.

PRICES: Box 10 cents p. p. Dozen lots \$1.00 p. p.

STERLINGWORTH NATURAL FISH FOOD

For Aquarium Fishes

This is a granular food made from cooked meats and cereals, granulated into pin head sized kernels. Preferred by many to any other food for Gold-fish.

Sample mailed free for stamp.

PRICE: 1 oz. tin, 10c. p. p.; one dozen tins, \$1.00 p. p.

STERLINGWORTH DOG REMEDIES

These remedies are tried and proven by many years' use and are sold with the understanding that they must give satisfaction or money refunded.

Sterlingworth Mange Remedy	50c. postpaid
Sterlingworth Laxative Pills	25c. postpaid
Sterlingworth Condition Pills	25c. postpaid
Sterlingworth Distemper Pills	25c. postpaid
Sterlingworth Tonic Pills	25c. postpaid
Sterlingworth Rheumatic Tablets	50c. postpaid
Sterlingworth Diarrhoea Tablets	25c. postpaid
Sterlingworth Sulphur Tablets	25c. postpaid
Sterlingworth Digestive Tablets	25c. postpaid
Sterlingworth Eye Lotion (1 oz. bottle)	25c. postpaid
Sterlingworth Vermifuge Capsules for Dogs ...	50c. postpaid
Sterlingworth Vermifuge Capsules for Puppies	50c. postpaid
Sterlingworth Vermifuge Capsules for Cats ...	50c. postpaid

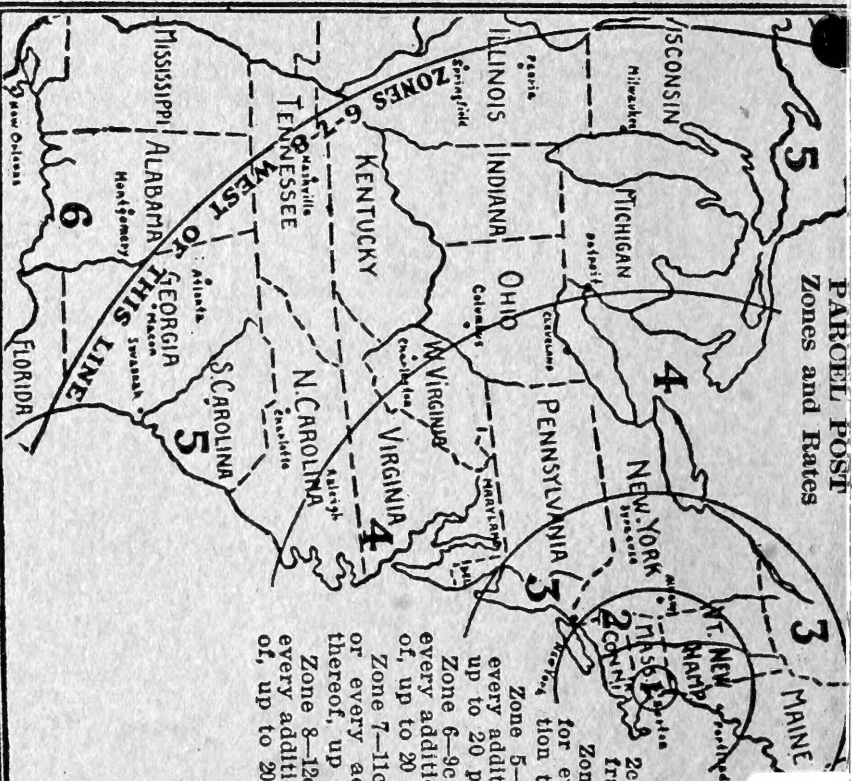


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Cage Bird Lice Salve	70	Plant Lice Killer	56
Cattle Oil	55	Plant Tablets	71
Copper Sulphate	53	Powder Guns	70
Creolusol	61	Powdered Tobacco	53
Crow Oil	57	Rat Killer	67
Cut Worm Killer	52	Red Spider Emulsion	53
Deluge Spray Pump	60	Roach Killer	69
Diarrhoea Remedy	64	Rcup Remedy	65
Disinfectant	61	Salt Cat	64
Dog Remedies	72	Scale Killer	50
Egg Preservative	60	Sheep Dip	56
Egg Tablets	66	Song Restorer	70
Fish Food	72	Spray Pump	60-62
Flea Killer	69	Sulphur Candles	52
Fly Oil	55	Sulphur	54
Food, Fish	72	Tarred Felt Disks	51
Goingslight Tablets	66	Tobacco, Powdered	53
Guaranteed Cattle Oil	55	Water Glass	60
Gypsy Moth Creosote	51	Weed Killers	58-59
		Whale Oil Soap	47

PARCEL POST Zones and Rates



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Zones 1 & 2—1c for first pound and 1c for every additional pound, or fraction thereof, up to 50 pounds.

Zone 3—6c for first pound and 2c for every additional pound, or fraction thereof, up to 20 pounds.

Zone 4—7c for first pound and 4c for every additional pound, or fraction thereof, up to 20 pounds.

Zone 5—8c for first pound and 6c for every additional pound, or fraction thereof, up to 20 pounds.

Zone 6—9c for first pound, and 8c for every additional pound, or fraction thereof, up to 20 pounds.

Zone 7—11c for first pound, and 10c for every additional pound, or fraction thereof, up to 20 pounds.

Zone 8—12c for first pound and 12c for every additional pound, or fraction thereof, up to 20 pounds.



